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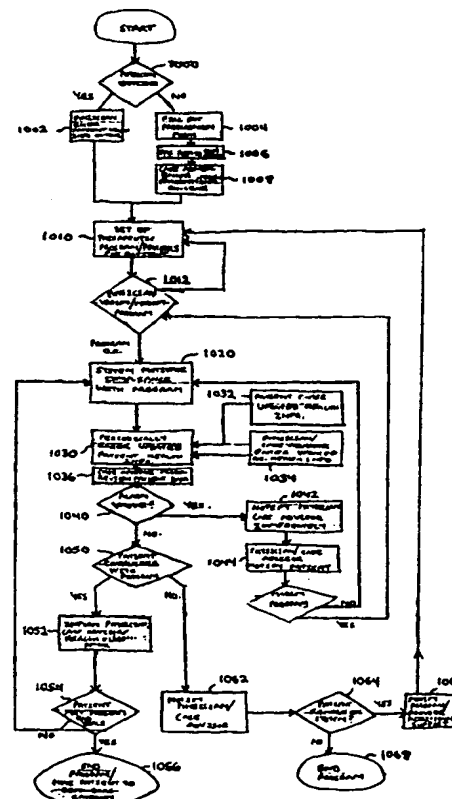
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(54) Title: THERAPEUTIC BEHAVIOR MODIFICATION PROGRAM, COMPLIANCE MONITORING AND FEEDBACK SYSTEM

(57) Abstract

A therapeutic behavior modification program, compliance monitoring and feedback system includes a server based relational database, and one or more microprocessors electronically coupled to the server. The system enables development of a therapeutic behavior modification program having a series of milestones for an individual to achieve lifestyle changes necessary to maintain his or her health of recovering from ailments of medical procedures. The program may be modified (1012) by a physician or trained case advisor prior to implementation. The system monitors the individual's compliance (1050) with the program by prompting the individual to enter health-related data (1030), correlating the individual's entered data with the milestones in the behavior modification program, and generating compliance data indicative of the individual's progress toward achievement of the program milestones. The entire system is designed around a community of support motif including a graphical electronic navigator operable by the individual to control the microprocessor for accessing different parts of the system.



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## THERAPEUTIC BEHAVIOR MODIFICATION PROGRAM, COMPLIANCE MONITORING AND FEEDBACK SYSTEM

### FIELD OF THE INVENTION

The present invention relates generally to a computer-implemented system for promoting wellness and improving health, and more particularly to a therapeutic behavior modification program, compliance monitoring and feedback system.

### BACKGROUND OF THE INVENTION

One of the most difficult and costly areas of health care, education, and rehabilitation involves the need for individuals to modify their behavior to prevent or recover from medical ailments. Heart disease, stroke, diabetes, asthma, chronic pain, depression, addiction, cancer and a wide variety of other ailments have been clinically shown to respond well to lifestyle modification, including changes to diet, exercise patterns, and stress levels. Patients who are recovering from a surgical procedure such as heart bypass surgery or are suffering from diabetes, for example, must often make lifestyle changes in order to survive.

When individuals are successful in making and adhering to positive lifestyle changes, they frequently require fewer physician visits, go to the hospital less often, and have fewer surgeries. Long term medical costs go down accordingly.

At present, many programs for helping patients make lifestyle changes involve a doctor's visit and distribution of a brochure describing the health benefits of behavior modification and lifestyle change. This method is often ineffective in modifying behavior because there is little or nothing in the way of an on-going support mechanism to assist the patient in complying with recommendations, insufficient means for motivating the patient to make recommended changes, and insufficient means for monitoring compliance with such recommendations. Participation in an on-going support program is often effective for patients who have undergone surgery and must make subsequent lifestyle changes, but currently available in-person programs involve costly medical staff and facilities. It can also be inconvenient for the patient to travel to such programs on a regular basis. Because of their cost and the potential for inconvenience, many support programs last for only a limited time, which is often insufficient for the patient to modify behavior thoroughly and effectively.

1 Another disadvantage of existing lifestyle modification programs is the lack of  
information readily available to the physician regarding the patient's compliance with the  
program. With the present push toward low cost yet high quality health care, a system by which  
a physician could readily access information on patient compliance has clear benefits.

5 The development of a therapeutic program that could effectively motivate patients to  
modify their behavior and change their lifestyles to prevent or recover from ailments, and could  
be delivered to them electronically at home, work, or while traveling, would be highly desirable.  
It would also be desirable for such a system to enable physicians and their staffs to receive  
frequent feedback regarding patients' compliance with their programs. It would be further  
10 desirable if such a system allowed for aggregate reviews of such information by health plan  
payors, such as HMOs, insurance companies, and large self-insured employers, for the purpose  
of enhancing the efficiency of managed health care.

## 15 SUMMARY OF THE INVENTION

The present invention therefore provides for an integrated, computer-implemented,  
electronically deliverable patient therapeutic behavior modification program, compliance,  
monitoring, and feedback system which supports the design of customized therapeutic behavior  
and lifestyle modification programs for subscribers; accepts the input of current health data for  
20 these patients; enables the review of these health records by a physician; enables the performance  
of aggregate reviews of such records by health plan payors, such as HMOs, insurance companies,  
and large self-insured employers; and motivates the patient to comply with the program and  
make the necessary lifestyle changes through an integrated system of interactive graphical  
interfaces.

25 In an exemplary scenario, a physician prescribes parameters and goals for a such a  
therapeutic behavior modification program to help a patient recover from an ailment or surgical  
procedure, and these are input into the computer-implemented system. Alternately, one of  
several established behavior modification programs that have been designed for patient recovery  
from particular ailments or procedures can be utilized. The system provides a novel interface  
30 that allows immediate patient access to the behavior modification program and helps monitor  
compliance with the program by prompting the patient to input data relating to his or her  
adherence to the program's parameters. These parameters may relate, for example, to diet,  
exercise, and other factors pertinent to the behavior modification program. The patient,  
physician, case manager or members of the physician's staff may also input information relating  
35 to blood pressure, medication, and the results of other medical tests on a computer linked to the  
system. Using this input, the system can recommend a plan (also referred to as a therapeutic  
program) and goals based on established medical protocols. The physician can modify the  
program to customize it for the patient. Once the patient has begun to follow the program, the



1 system recommends modifications and updates to both physician and patient by correlating the  
patient's progress with previously established goals.

5 The system provides ongoing multimedia (audio, video, and e-mail) feedback to the  
patient through a novel, user-friendly interface designed around an interactive "village" or  
"community of support" motif that allows him or her to navigate electronically through different  
parts of the system. The interface provides access to pertinent medical information, an on-line  
journal that enables the patient to write down his or her feelings on a regular basis, an electronic  
calendar which integrates events mandated by the program with the patient's daily schedule, on-  
line interactive group support sessions with patients on similar programs, and motivational  
10 multimedia presentations. The system can make specific diet and exercise suggestions based on  
the patient's overall program. This data is monitored by a professional case advisor--a nurse  
trained in the protocols of the system's software--as well as electronically by the system's  
protocols themselves. The system provides specific feedback to the physician so that he or she  
15 can modify or update the program as the patient progresses; and in the aggregate to the health  
plan payor to assess management and cost factors. The health plan payor can also view  
individual records which are obtainable after receiving the proper medical release from the  
patient. By providing several channels of continuous feedback among the patient, physician,  
professional case advisor, and health plan payor through custom designed interfaces, the system  
helps enhance patient compliance with the behavior modification program, and can help make  
20 the overall health care system more efficient.

#### BRIEF DESCRIPTION OF THE DRAWINGS

25 These and other aspects of the present invention will become more apparent from the  
following Detailed Description of a presently preferred embodiment of the present invention read  
in conjunction with the accompanying drawings and exhibits, in which:

FIG. 1 is a block diagram illustrating how feedback and monitoring is used in the current  
embodiment of the therapeutic behavior modification program's compliance monitoring and  
feedback system

30 FIG. 2 is an exemplary prescription form for inputting a patient's baseline vital factors;

FIG. 3 is a graphical representation of a set of files for patients for whom recovery  
programs may be designed or modified;

FIG. 4 is a graphical representation of an exemplary patient file taken from among those  
represented in FIG. 3;

35 FIG. 5 is a graphical representation corresponding to the program Design option of FIG.4;

FIG. 6 is a graphical representation corresponding to the Program Detail option of FIG. 5;

FIG. 7 is an exemplary patient progress report;

1 FIG. 8 is a graphical representation of various interface tools, organized around a village motif, available to a clinical group patient;

FIG. 9 is a graphical representation of the system's Inner Core option;

FIG. 10 is a graphical representation of the system's Schedule Book option;

5 FIG. 11 is an expanded graphical representation of the Schedule Book;

FIG. 12 is a graphical representation of the system's Journal option;

FIG. 13 is an expanded graphical representation of the Journal;

FIG. 14 is a graphical representation of the system's Meeting Room option;

FIG. 15 is a graphical representation of the system's Coffee Shop option;

10 FIG. 16 is a graphical representation of the system's Post-office option;

FIG. 17 is a graphical representation of the system's Note option;

FIG. 18 is a graphical representation of the system's Postcard option;

FIG. 19 is a graphical representation of the system's Telegram option;

FIG. 20 is a graphical representation of the system's Audio E-mail option;

15 FIG. 21 is a graphical representation of the system's Kitchen option;

FIG. 22 is an expanded graphical representation of the Kitchen option;

FIG. 23 is a graphical representation of the system's Recipes option;

FIG. 24 is an expanded graphical representation of a Shopping List option;

20 FIG. 25 is an expanded graphical representation of an educational topic available through a pull-down menu in FIG. 22;

FIG. 26 is a graphical representation of the system's Gym option;

FIG. 27 is a graphical representation of a Stretching option of FIG. 26;

FIG. 28 is a graphical representation of a Strength Training option of FIG. 27;

FIG. 29 is a graphical representation of the system's Tranquility Park option;

25 FIG. 30 is a graphical representation of the system's Relaxation option;

FIG. 31 is a graphical representation of the system's Yoga option;

FIG. 32 is a graphical representation of the system's Library option;

FIG. 33 is a graphical representation of the system's Articles option;

FIG. 34 is a graphical representation of a World Wide Web access option;

30 FIG. 35 is a graphical representation of an educational topic available through a pull down menu in FIG. 32;

FIG. 36 is a graphical representation of the system's Travel Agency option;

FIG. 37 is an alternative user interface screen provided by the system;

35 FIG. 38 is a graphical representation of a log-on screen for a physician or case manager in accordance with another aspect of the present invention;

FIG. 39 is a graphical representation of a main menu available to a physician or case manager;

FIG. 40 is a graphical representation of an exemplary patient file;

FIG. 41 is a graphical representation of a blood pressure chart for an exemplary patient;  
FIG. 42 is a graphical representation of a physical activity chart for an exemplary patient;  
FIG. 43 is a graphical representation of a weight chart for an exemplary patient;  
FIG. 44 is a graphical representation of a cholesterol chart for an exemplary patient;  
FIG. 45 is a graphical representation of the system's Behavior option;  
FIG. 46 is a graphical representation of the system's Recommend option;  
FIG. 47 is an expanded graphical representation of the system's Communicate option;  
FIG. 48 is a graphical representation of the system's Video Conferencing option;  
FIG. 49 is a graphical representation of a main menu available to a health plan payor or employer;  
FIG. 50 is a graphical representation of a View Compliance Status option;  
FIG. 51 is a graphical representation of a View Comparative Costs option;  
FIG. 52 is a graphical representation through which the system indicates whether the patient has executed a limited waiver of confidentiality;  
FIG. 53 is another graphical representation of an exemplary patient record;  
FIG. 54 is a graphical representation of the system's Review Costs option;  
FIG. 55 is a graphical representation of the system's Review Outcomes option;  
FIG. 56 is a graphical representation of the system's Perform Utilization Review option;  
FIG. 57 is a graphical representation upon selection of an exemplary physician group of FIG. 55;  
FIG. 58 is an expanded graphical representation of a Communicate option of FIG. 48;  
FIG. 59 is a block diagram of the therapeutic behavior modification program's compliance monitoring and feedback system; and  
FIG. 60 is a flow diagram illustrating certain aspects of the therapeutic behavior modification program's compliance monitoring and feedback system.

To facilitate description of the present invention, reference is made in numerous instances to the flow diagram of FIG. 60. For convenience, the blocks in the flow diagram are numbered beginning at 1000.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, in a presently preferred embodiment of the invention, the patient 10, physician 12, case advisor 14, and health plan payor 16 (such as an HMO, insurance company or self-insured employer), all provide input to and/or receive output from the therapeutic behavior modification program's compliance monitoring and feedback system. The case advisor may be a doctor, nurse, and/or other trained medical professional experienced in case management protocols and practices. Patients electronically interact with the system, the case

1 advisor and their doctor through the system interface 18. The behavior modification program  
is customized to fit the health care and recovery needs of individual patients. The system  
provides at least two separate benefits: it helps the patient comply with the program through an  
electronically-implemented support mechanism; and further assists in monitoring such  
5 compliance.

A wide range of individuals can benefit from the system. By way of example only, these  
individuals include those with chronic ailments such as coronary artery disease, diabetes, chronic  
pain, depression, addiction, arthritis, cancer and asthma, as well as patients who are recovering  
from medical procedures such as angioplasty or by-pass surgery (the "clinical group").

10 Individuals who simply want to maintain their health and prevent or reduce the risk of  
such ailments (the "wellness group") can also benefit from the program. For these individuals,  
the program may be focused on stress management, diet, and exercise. The wellness group may  
further include family members of the clinical group who may need group support and/or  
counseling in dealing with the family member's chronic illness.

15 The members of the wellness group may not need all the features available to members  
of the clinical group. Furthermore, access to certain areas within the system may be limited  
and/or customized to meet the individual user's needs. However, wellness group members may  
choose to use the case management functions as a "virtual coach." For example, an individual  
may want to have a case advisor assist them in losing weight by helping the individual change  
20 his or her nutrition, exercise and stress management habits. The "virtual coach" or case advisor,  
can provide ongoing feedback and encouragement throughout the process. Wellness participants  
may also choose to join an on-line support group to help them achieve their health and wellness  
goals.

25 In an exemplary scenario, a physician diagnoses an individual with an ailment. The  
physician may then recommend a health care maintenance or recovery program which requires  
the patient to: take certain medications; participate in a support group; and control risk factors  
by altering his or her diet, following an exercise program, and managing stress levels.

The physician can then place the patient on the system to help him or her make these  
desirable or necessary lifestyle and behavior modifications. In order to subscribe the patient to  
30 the system, his or her baseline vital factors are entered. Such factors may include blood pressure  
readings, heart rate, height, weight, and cholesterol levels. Depending on whether the doctor is  
on-line (block 1000, FIG. 60), The doctor may input these vital factors into the system directly  
via his or her personal computer (block 1002, FIG. 60). Alternatively, the physician may fill  
out a prescription form and send the information to a case advisor, who then sets the patient up  
35 on the system (blocks 1004, 1006 and 1008, FIG. 60).

Referring to FIG. 2, an exemplary prescription form 22 contains identification information  
23 such as the patient's name and identification. Using the form, the physician selects a  
diagnostic category 24 and prescribes a recovery program level 26. In the exemplary

embodiment, eight separate diagnostic categories exist that correspond to the state of the patient's health. Category I, for example, includes patients who have suffered from a heart attack within the current year, while Category VIII includes patients who suffer from no particular ailment but are on the plan simply to promote wellness. Other categories may also be added as necessary.

Depending on the diagnosis, the physician may recommend that the patient cease smoking or that he or she lose a targeted amount of weight within a certain period by circling the appropriate response in field 30. The physician may also enter other information, such as the patient's medications 32. The physician then circles or fills in desired 3-month targets 34 relating to, among other things, daily calorie intake, percent daily intake of saturated fat, maximum heart rate, and cholesterol level.

Referring to FIG. 3, the case administrator sets up a new patient based on information contained in the patient prescription form or accesses the records of existing patients through patient files 40. In this example, the patient files 40 are identified by the patient's name and social security number. To create or modify the program for a particular patient, the administrator creates a new folder or selects a preexisting folder 42 corresponding to the patient in question.

Once the physician or case administrator enters the patient into the system, either the system or case advisor recommends a default set of goals based on the patient's needs and existing medical protocols that may be modified by the physician (blocks 1010 and 1012, FIG. 60). FIG. 4 illustrates an exemplary patient record after selection of the desired patient file 42 in FIG. 3. The record includes, among other things, the patient's current status and program goals. The first column 44 of the record sets forth fields for pertinent patient information including the patient's vital signs (e.g., weight, cholesterol level, blood pressure), other baseline characteristics (e.g., patient's smoking habit, physical activity, alcohol and eating habits, depression and stress levels, seat belt use), and information relating to any medications used by the patient. The second column 46 of the record sets forth the baseline values corresponding to the vital signs and patient characteristics at the beginning of his or her participation in the program. As shown in the third column 48, the record may be updated on an ongoing basis by taking data from the patient on-line and from subsequent office visits. Based on the patient's initial evaluation and/or short-term progress, the physician or case advisor can design a new program or modify an existing program for the patient by selecting the system's Design option 50.

Referring to FIG. 5, upon selection of the Design option 50 in FIG. 4, the system prompts the physician or case advisor to assign intensity levels 51 corresponding to the patient's diet, exercise, stress management, need for group support, anticipated compliance, and pharmaceutical requirements. The intensity levels in this example range from a lowest level of 1 to a highest level of 5. Other measures of program intensity may also be included.

1       Based on the input information, the system, case advisor or physician generates a set of  
goals 52 or milestones for the patient. This is done by correlating patient information such as  
age, sex, weight and information relating to the health, life situation and diagnostic category of  
the patient to established medical protocols for that type of patient. Other pertinent information  
5       that may be taken into account includes the patient's medication and other health conditions.  
Based on the correlation, the system suggests a therapeutic program including goals relating to  
intake of calories from fat, exercise level, stress management counseling, and group support and  
compliance management frequency. The physician or case advisor may view details as to how  
the suggested goals may be implemented by selecting the system's Program Detail option 54.

10       Referring to FIG. 6, upon selection of the Program Detail option 54, the patient record 60  
is presented along with the recommended one month goals 61 and final goals 62. The physician  
or case advisor may confirm 63 or edit 64 the suggested program to modify the goals by making  
appropriate selections (block 1012, FIG. 60).

15       The content of the patient records and the generated goals vary depending on the patient's  
diagnostic category. For example, some of the information shown on the patient record may not  
be necessary for an individual belonging to the wellness group. Information regarding calories,  
cholesterol level, blood pressure, and seat belt use, for instance, may not pertain to a person who  
is on the system to get support to help deal with a family member who suffers from a chronic  
ailment.

20       Referring to FIG. 7, the system also sends an exemplary patient status report 70 to  
physicians who do not have direct access to the system. The status report may include  
information regarding a patient's current status 66, suggested next steps 67, and target goals 68.  
Other information may also be included in the status report as desired by the physician. The  
physician has the option to agree with the suggested next steps 69 or indicate changes to the  
25       program. The physician then sends the report 70 back to the case advisor for modification of the  
program as necessary. Communication may take place via e-mail, facsimile, or any other method  
of transferring data.

30       Once the patient is set up on the system, it assists him or her in complying with his or her  
behavior modification program (block 1020, FIG. 60). To use the program, the patient logs into  
the system network via telephone line, cable modem, cellular connection, satellite link or other  
communication method that allows for a connection into a network server.

35       Referring to FIG. 8, in a presently preferred embodiment of the invention, the user  
interface for patients in the clinical and wellness groups is organized around a village motif. The  
user progresses through the system by following paths through a graphically represented town  
square to destinations including the village gymnasium 71, tranquility park 72, post office 74,  
coffee shop 76, store 78, library 80, travel agency 82, as well as the user's own "home" 84. The  
village motif presents the patient with an image of a community of support. The entire on-line  
community revolves around his or her recovery and well-being, and this helps bolster the

1 patient's confidence and motivation. Furthermore, the village motif provides an easy-to-understand representation of the system's structure. The patient learns to navigate the system more quickly and easily because of the intuitive town layout.

5 Another benefit of the village motif is its familiarity. A patient afraid of technology will be reassured through the symbolic images of home and neighbor, street and store. Finally, the patient may find navigating an electronic "neighborhood" more enjoyable than a traditional text-menu-driven system. Other user interfaces, such as the one described in conjunction with FIG. 37, are available.

10 Referring to FIG. 9, the inner core 86 of the village provides the user with a schedule book icon 90, a journal icon 94, a meeting room icon 96, a mail icon 98, and a rewards icon 92. These give the user access to additional tools that assist with complying with his or her health program, and further help the physician or case advisor monitor such compliance.

15 Referring to FIG. 10, upon selection the schedule book icon 90 from the interface of FIG. 9, the system displays a graphical representation of a schedule book 90A. As shown in FIG. 11, the schedule book presents the user with a list of meetings that the user can participate in via his or her computer. The list of meetings varies for each user depending on his or her specific health recovery program. The schedule book also presents general information on the meetings, including time 100, date (not shown), and meeting profile 104, with a notation of how many people have signed up for the meeting 106. The system also sets a limit on the maximum number of individuals that may sign up for a meeting.

20 Based on this information, a user may then sign up for the meeting that best fits his or her schedule. Other factors, such as the city in which the other members are located 108 may also influence the user's choice. A user may decide to join a group whose members are located in his or her home city if he or she wants to meet these people face-to-face someday.

25 The system integrates the user's schedule book 90A with the user's personal electronic daily calendar. For example, after a patient signs up for a meeting, the system downloads the day and time of the meeting to the user's calendar. The calendar may be any suitable commercial calendar or organizer program, such as Organizer™ available from Lotus Development Corp.

30 In an alternate embodiment, the user may make a further request via the schedule book for automated reminders to be sent to him or her by e-mail.

35 Referring again to FIG. 9, the system also enables the user to access an integrated patient journal 94 from the village's inner core and self-report their progress and describe their feelings. Selection of a journal icon leads the user to a journal 94A like one shown in FIG. 12. Upon entering the journal 94A, the user has the option to view the personal goals that have been set for him or her by the physician or case administrator. The journal also provides a diary used to make a daily record of information pertinent to accomplishing the user's goals. The journal 94A provides an important tool that lets the patient express his or her feelings and fears in a

1 context other than that of a support group. By journaling, the patient can identify fears  
concretely, and thus begin to address them. Goal setting is also often more meaningful when it  
is written down. Instead of merely thinking about ambiguous hopes, patients can define in  
5 written form the concrete milestones they plan to attain. These notes can also help remind the  
patient of matters he or she might wish to discuss in support group meetings. The system also  
uses certain notations in the journal to assist in generating reports to the physician or case advisor  
regarding the patient's progress. As part of its overall security measures, the system separates  
those journal entries which the patient wishes to keep private from those which are to be used  
in generating reports.

10 FIG. 13 exemplifies the type of information which may be contained in the journal. For  
instance, a heart patient belonging to a clinical group may need to monitor his or her emotions  
100 as well as the exercises he or she has been doing 104 by means of the journal. Depending  
on the patient's program, the system might also prompt the patient to input his or her vital signs  
102, such as blood pressure and heart rate, in the journal. This can be done manually or  
15 automatically. For example, devices can be hooked into the computer's serial port for automatic  
input of blood pressure and heart rate into the system. Depending on the particular program,  
patients might be required to weigh themselves on a weekly basis and/or measure their  
cholesterol level with a home cholesterol kit on a relatively less frequent basis. This information  
is stored in the system's database and is accessible to the physician and case advisor.

20 The kind of information required of a person in the wellness group may differ from this.  
For example, if a user is in the wellness group because a family member is suffering from a  
chronic illness, it will not be necessary for him or her to input vital signs into the journal.  
Rather, information as to how he or she is doing emotionally, as well as information as to how  
much group support he or she is getting, may be solicited.

25 The user may also record his or her personal comments in the journal. This information  
may only be viewed by the individual user, and is not available to the case advisor or physician.

The journal is also integrated with the user's daily calendar. The user may, for example,  
input information as to his or her exercise schedule (such as 30 minutes walking on Tuesdays,  
Thursdays, and Saturdays) or meditation schedule into the journal. The system then downloads  
30 this information into the user's daily calendar. Previous journal entries may also be viewed.

In addition to allowing the patient to electronically enter his or her updated health  
information, the journal also provides the physician or case advisor with a means of getting  
feedback on the patient's progress. The information recorded in the journal is electronically  
forwarded to the case advisor. Alternatively, the case advisor has direct access to portions of the  
35 journal stored in the system's database. The physician or case advisor can use the information  
provided in the journal to update the program on an on-going basis.



1       The system also accepts additional patient data obtained during office visits or directly  
from the patient via e-mail or other means of communication. The physician may also input  
additional data, such as that derived from laboratory tests, into the system. Accordingly, the  
system accepts updated patient data directly from the patient and through data entered by the  
5       physician during office visits (blocks 1030, 1032 and 1034, FIG. 60).

10       The system automatically correlates the patient's input with the physician's to check  
for accuracy. In addition, the system automatically provides the physician with reports of  
patient progress. Depending on the patient's plan requirements, the case advisor periodically  
reviews the patient-reported and physician-reported input to monitor whether the patient is  
complying with program parameters and meeting goals (block 1036, FIG. 60).

15       As part of the feedback process, the system provides an "alarm" option (block 1040,  
FIG. 60). The system compares actual data about the patient with the goals and parameters  
residing in the system's database and automatically notifies the physician or case advisor via  
e-mail or facsimile (or pager depending upon the severity of the problem), if a health risk is  
present (block 1042, FIG. 60). For instance, if a patient's current blood pressure is potentially  
dangerous, the system will automatically send an alarm to the physician or case advisor and  
require his or her immediate action.

20       If the difference between current data and goals does not present a threatening situation,  
the system will simply notify the physician or case advisor that these goals are not being met.  
For example, if the current data states that the patient has lost 5 pounds instead of 10, the  
system will notify the physician or case advisor of this fact. This information, although not  
life-threatening, must nonetheless be addressed by the physician or case advisor. He or she  
may then contact the patient in order to support and to further motivate him or her to meet  
the desired goals (block 1044, FIG. 60). In addition, the physician or case advisor may  
25       recommend that the program be modified to suit the patient's condition (block 1046, FIG. 60).

30       Regardless of whether an alarm condition exists, the system periodically correlates the  
updated patient health information with the program goals to determine the patient's progress  
and compliance with the program (block 1050). If the patient is progressing in accordance  
with his or her program, the system informs the physician and/or case advisor (block 1052,  
FIG. 60). The physician or case advisor may then provide positive reinforcement to the  
patient. Depending on the patient's progress, the case advisor or physician can also determine  
whether to modify the program by altering the goals or moving the patient into a different  
diagnostic category. The patient may even be removed from the system if he or she has met  
program end goals (blocks 1054, 1056, FIG. 60).

35       The system also notifies the physician or case advisor if the patient is not progressing  
toward program goals or is not using the system (block 1060, FIG. 60). The case advisor  
along with the physician then determines whether to modify the patient's therapeutic program,

1 provide the patient with additional support, or remove the patient from the system (blocks 1064, 1066 and 1068, FIG. 60).

5 The system also enables direct feedback to the individual user. As one of the features of the journal, users may view their levels of compliance and achievement of goals. Patients may not recognize they are making progress until presented with reminders of how much they have improved. System generated charts and summaries, discussed below with respect to FIGS. 41 to 44, provide patients with an overview of how far they have come.

10 Referring again to FIG. 9, as another tool to assist patients to comply with their programs, the system offers an electronic meeting room and group support room interfaces via meeting room icon 96 through which a patient receives on-going, on-line group support. Putting a patient in contact with people with the same or similar problems through group counseling has clinically-proven therapeutic benefits. The system facilitates this process through the use of electronic and on-line technologies. On-line group counseling solves many of the logistical difficulties encountered in bringing together, on a regular basis, a large group of people with different schedules who live in different places. Instead of requiring patients to travel physically to a single location, the system enables them to attend group meetings by simply logging on to their computers. As the burden on the individual patient decreases, group attendance increases, and this enhances the overall practical, therapeutic value of group counseling and support.

20 On-line counseling also brings a patient into contact with a wider pool of people with similar problems than traditional counseling can. When desirable or necessary, group membership can be drawn from people in a wide variety of regions, instead of being limited to a single vicinity.

25 Furthermore, the relative anonymity of electronic communication benefits patients who are reserved or possibly embarrassed by their situations. These patients may be more willing to share their feelings in an on-line environment than they would be face-to-face.

30 Patients have access to the meeting room interface via a meeting room icon 96. Upon selection of the meeting room icon 96, patients are presented with meeting rules and regulations. They may then proceed to a pre-scheduled meeting. Only those scheduled for a meeting will be permitted to attend. The scheduling of meetings is part of the schedule book interface explained above in conjunction with FIGS. 10 and 11.

35 Referring to FIG. 14, each participant 112 may chose to represent him or herself in one of two different ways in the meeting room. The participant 112 may have his or her photo scanned to represent him or her in the system. Alternatively, if anonymity is desired, the patient may choose to be represented by a non-photographic icon, or "avatar," accompanied by either his or her own name or a pseudonymous screen name. The patient will then be represented by that avatar in group meetings and private mentoring sessions. In some cases, patients may choose to design and construct their own avatars.

1 A trained, experienced leader or chairperson 114 is an important part of these group  
counseling sessions. It is the chairperson's responsibility to guide the discussion and encourage  
participation from all members. To enhance the beneficial aspects of group counseling, the  
system allows the chairperson 114 to access selectively certain parts of the patient's on-line  
5 journals and electronically display the selected portion in an anonymous manner to the on-line  
group. The chairperson can also cut somebody off electronically if he or she is saying things  
that are inappropriate.

In the preferred embodiment, a participant 112 "speaks" during the meeting by entering  
text at 122. Upon hitting the enter key, this text appears as "bubble-talk" 116 above the  
10 representation of the participant 112 who entered the corresponding text. In an alternate  
embodiment, instead of using a "bubble-talk" format, each participant 112 may participate at  
the meetings by talking into a microphone connected to his or her PC, and listening to other  
participants via speakers also connected to the PC.

A log window 110 keeps a running or scrolling record of the conversations during the  
15 meeting. Thus, if a participant 112 loses track of the conversation, or wants to comment on  
something said earlier, he or she has access to the entire conversation as reference.

During group counseling meetings, a chairperson 114 may play on-line multimedia  
presentations featuring other patients or well-known figures who have made positive lifestyle  
changes. In the presently preferred embodiment, each participant has access to the multimedia  
20 presentation, such as a video clip, via CD-ROM or DVD received by mail on a regularly  
updated basis. Alternatively, if the user has access to the appropriate software and hardware,  
and has a connection of sufficient bandwidth to the server, the multimedia presentation may  
be streamed to him or her over the network. In addition to CD-ROM, the system can also  
use DVD disk, downloads to the user's computer hard drive, or any other method or medium  
25 capable of storing or transmitting audio and video data.

When it is time to view the multimedia presentation, the chairperson selects, for  
instance, a particular video clip from a menu of video clips available on his or her CD-ROM  
or DVD. This sends a signal via the network to each participant's PC. The signal received  
matches a code on each participant's CD-ROM or DVD, which triggers the playing of the  
30 selected video by the PC. If the video is stored on DVD disk or on the user's computer hard  
drive, or some other storage medium, the video could be triggered to play from that medium  
as well.

The participants may not play the video prior to the meeting because only the  
chairperson has access to the code which releases the video. Thus, prior to a meeting, users  
35 may view a list of videos in his or her CD-ROM, DVD disk, hard drive, or other storage  
medium, but videos which have not been shown already at meetings will be inaccessible for  
viewing. Once a video is released by a chairperson and played for the first time at a meeting,  
the participants may access it any time thereafter.

1 The case administrator or advisor knows in advance who the chairperson for a meeting will be and will give him or her access to the video clip to be shown at that meeting.

5 The multimedia presentations shown at the meetings may feature well-known or public figures and other patients who may have dealt with the same issues that the participants are facing. For example, in a meeting for patients who have suffered heart attacks, a video clip of a celebrity who recovered from a similar problem may be shown. In the clip, the celebrity would talk about his or her own heart attack, the bypass surgery that he or she underwent, and the depression that followed. The celebrity would also describe other struggles that he or she faced, and how these struggles were overcome during the recovery process. Likewise, video clips of program participants may also be used to provide motivational examples of success stories, or to express deep-felt emotions (e.g., anger, depression, etc.) that must be dealt with by that individual and other members of the group in order to be successful in his or her recovery.

15 Such presentations may act as a source of motivation to the participants, giving them a sense of hope. If someone else was able to overcome the same obstacles, they can too.

The presentations may stimulate further discussion during the meeting, and allow participants to open up about the issues and struggles that they are facing during their recovery process.

20 Another function provided by the meeting room 96A interface is electronic telephone dialing. Each participant has a phone icon 118 in front of his or her avatar. If a participant wants to talk to any other person in the meeting, he or she may click on the phone icon and the telephone number to that person is dialed automatically. This allows the members to contact each other after meetings to talk further via regular phone lines if desired. The conference room participants also have direct access to a more private mentoring area by clicking on a coffee shop icon 76B. Users of the system may also gain access to this private mentoring area by selecting the coffee shop 76 from the village as shown in FIG. 8.

25 FIG. 15 is an exemplary illustration of the inside of the coffee shop 76B. Conversation here occurs much like in the meeting room 96A, except for the fact that the conversation is not monitored and structured by a chairperson. Text is inputted at 132 and appears as bubble talk at 134. A record of the conversation is also kept at the log window 130.

30 In the preferred embodiment, the system allows a maximum of four people into a single coffee shop at a time. Such a restriction is desirable given that the purpose of the coffee shop is for one-on-one mentoring. In the private setting of a coffee shop, more experienced individuals can pass on their experiences to less experienced ones as well as advice as to how to overcome the obstacles that they may be facing.

35 The group support room 96A and coffee shop 76B applications are implemented by means of third-party chat room applications such as Palace, commercially available from The Palace, Inc., Beaverton, Oregon. The chat room applications may be integrated into the

1 system and modified to provide additional functionality. Triggering of multimedia  
presentations during group meetings and the monitoring of attendance are separately  
programmed into the system.

5 Through on-line group meetings and private mentoring rooms, the system allows  
patients to maintain contact with other people who have the same or similar problems, all in  
entertaining ways that encourage and assist the patient to adhere to program parameters and  
achieve program goals.

10 The communications feature of the system further allows users to keep in constant  
contact with their physician, case advisor, or other users of the system. Although in the  
presently preferred embodiment of the invention communication is done via e-mail, other  
methods of communication may also be used. For instance, it is envisioned that the system  
will allow instant messaging, conference calls, and/or video conferencing as alternate means  
of communication.

15 Referring again to FIG. 9, the mail icon 98 gives a user access to the e-mail feature.  
A user may also access his or her e-mail by selecting the village post office 74 shown in  
FIG. 8.

Referring to FIG. 16, the system includes four different types of e-mail options: letters  
140, postcards 142, telegrams 144, and audio e-mail 146.

FIG. 17 is an example of a letter 140A, which functions as standard e-mail.

20 FIG. 18 is an example of a postcard 142B, which may be used to send short notes. For  
instance, postcards may be sent to users to survey the level of satisfaction with the service  
provided by the system. The postcard would contain questions on this issue, and users would  
be asked to send the postcard back after having answered the questions.

25 FIG. 19 is an example of a telegram 144A, which has the highest priority among the  
types of e-mail provided by the system. The telegram may be used, for instance, to alert a  
user that he or she has missed a meeting, or just as a short note of encouragement by the case  
advisor or group leader to an individual user.

FIG. 20 is an example of an audio e-mail 146A notification. Upon clicking this icon,  
users can hear a recording of the message sent to them via speakers attached to their PCs.

30 The communications functionality may be implemented by integrating any one of a  
number of conventional e-mail programs with the system.

35 As will become more apparent from a detailed description of the system's other  
interfaces, the system takes a two-pronged approach to behavior modification: education and  
motivation. Entertainment is used as a means of both educating and motivating a user to  
make the sometimes difficult changes required for recovery or even for maintaining a healthy  
lifestyle.

1 Motivation is one approach to behavior modification. It is the path from education to  
compliance, which is a goal of the system as a whole. The support group and case advisor  
described above add a human element to this motivational component. Patients are more  
likely to respond positively to the encouraging words of others than they would be to a  
5 program which must be followed in isolation.

The system's multimedia capabilities allow it to use graphics, videos, and music to  
communicate and educate. These features provide a refreshing boost to the patient's endeavor  
to modify his or her behavior, replacing the drudgery typically associated with clinical medical  
rehabilitation programs. Segments featuring celebrities, medical experts, motivational speakers  
10 and successful program participants delivering motivational speeches and personal testimonials  
further inspire the user. Humor is integrated throughout the system, for example in the  
whimsical artwork. The entertainment derived from these features of the system is used to  
spark and maintain the patient's interest in the unfolding drama of his or her recovery and  
lifestyle change.

15 The rewards feature is yet another motivational tool provided by the system. Referring  
again to FIG. 9, the reward "apples" icon 92 allows a user to view information on the rewards  
point system and how it works, as well as the user's own personal rewards account. Users  
may earn points by good participation in the program and by reaching certain milestones. For  
instance, points may be earned for good attendance at meetings, good participation during the  
20 meetings, chairing a meeting, or losing a certain amount of weight, if this was a goal to be  
accomplished.

Rewards range from the symbolic kind, such as getting "gold stars" that commend a  
user for his or her progress, to reward points and frequent flier miles which may be  
exchanged for goods in the village store 78 or plane tickets in the village travel agency 82,  
25 respectively.

Education is a complementary behavior modification approach offered by the system.  
Education is provided through informative on-line multimedia presentations and the interactive  
areas of the village devoted to diet, exercise, and stress management. For example, the  
recipes provided in the village kitchen, discussed below in conjunction with FIGS. 21-24, are  
30 designed to improve patients' diets without forcing them to take on impossible austerities or  
give up their love for food.

Exercise and stress management programs, discussed below in conjunction with  
FIGS. 26-31, are designed both to allow for variety and to lie within the individual patient's  
ability range. By making exercise and a healthy diet both feasible and interesting, the system  
35 enables patients to stick with their new lifestyles.

The system also provides relevant articles and includes hyperlinks to other, reputable  
Internet sites devoted to providing medical and health-related information, as discussed below  
in conjunction with FIGS. 32-35.

1 Referring again to FIG. 8, the system encompasses a "home" 84 interface as part of the village motif. Upon its selection, a screen showing the inside of the user's "home" 84 follows, as depicted in FIG. 21. Once inside his "home" 84, the user may access the kitchen by selecting the kitchen icon 150.

5 FIG. 22 illustrates the interior of the user's kitchen 155. Once in the kitchen 150A, users have the option to get nutritional and dieting information from low-fat cookbooks 153, or view and print recipes from a recipe book 154. FIG. 23 gives an example of a recipe which may be contained in the recipe book 154.

10 Referring again to FIG. 22, users also have the option to prepare and print a shopping list 156. A user may chose several recipes from the recipe book 154, and the system can automatically enter the ingredients into the user's shopping list 156. The user can also manually enter items into the shopping list 156 via his or her PC keyboard. FIG. 24 gives an example of a user's shopping list.

15 The system can also indicate which recipes are allowable under the particular patient's program. For example, the system might recommend certain low-fat items that meet the criteria of a patient's program as well as suitable foods he or she might consider when eating out. The system is also capable of generating weekly shopping lists based on program parameters. According to personal preference, users may choose to substitute certain allowable foods for other.

20 Moreover, users have access to a pull-down computer menu by selecting the computer menu icon 152. From this computer menu, users can access various educational topics related to food, nutrition, and diet. One such topic may, for instance, relate to the basic food groups and may provide information as to the suggested amount of servings for each category of food, as shown in FIG. 25.

25 The guest chef 158 option shown in FIG. 21 further allows users to view audio or video clips of a chef showing how to prepare a certain recipe. In the presently preferred embodiment, these clips are contained in the user's CD-ROM or DVD, but with proper technology could be sent via streaming audio or video.

30 From the kitchen, a user may substitute foods (e.g., asparagus for broccoli); access and print food related articles; view new recipes or articles by selecting the "what's new" button (not shown); or join a discussion group via a bulletin board (not shown).

35 Referring again to FIG. 8, another part of the village motif is the village gymnasium 71, which is used by the system to make recommendations or supply information regarding suitable exercise routines. Each exercise program is generated according to individualized parameters and needs, with progress being regularly charted by user input via the journal 94A (FIGS. 12-13).

1        Upon entering the gymnasium 71, a user may view featured video clips or listen to  
audio clips; do key-word searches to access and print exercise related articles; read and print  
exercise manuals; or join a discussion group via a bulletin board.

5        FIG. 26 illustrates the inside of a gymnasium 71 shown in FIG. 9. Shown here are  
various exercise topics 160 that a user may access. For instance, selecting the stretching topic  
162 gives the user information on recommended exercises for stretching different muscle  
groups. FIG. 27 illustrates one such stretching exercise.

10       Similarly, selecting the strength training topic 164 gives the user information on  
recommended exercises to help strengthen various muscle groups. FIG. 28 illustrates one such  
strength training exercise.

15       Referring again to FIG. 9, the village tranquility park 72 focuses on stress management  
strategies, including relaxation techniques, biofeedback, yoga, and meditation. Upon entering  
the park 72, a user may access and print articles on stress management subjects; view video  
clips or listen to audio clips on these subjects; and join discussion groups via a bulletin board.

20       An expanded illustration of the tranquility park 72 is shown in FIG. 29. Upon selection  
of the relaxation option 170, an instructional article on the subject is invoked, as shown in  
FIG. 30. Similarly, upon selection of the yoga option 172, an instructional article about yoga  
is invoked, as shown in FIG. 31.

25       Referring back to FIG. 8, the system also gives access to a village library 80 which  
allows users to do research germane topics. Thus, patients interested in learning more about  
their medial condition may access the library 80 in order to educate themselves on the topic.

30       FIG. 32 illustrates the interior of the library 80. From here, a user may select an  
Articles option 180 to gain access to an available list of articles 186 via his or her CD-ROM,  
as shown in FIG. 33. The kind of articles 186 available to a user will vary depending on the  
type of user. For instance, if the user suffers from a chronic cardiac condition, the articles  
186 will all relate to such topic. The list of articles 186 is updated on an ongoing basis to  
reflect new developments and research on the topic.

35       Users are also provided with hypertext links 188 to other reputable Internet sites  
devoted to providing medical and health-related information. These Internet sites may also  
be accessed by selecting the world wide web option 182 as shown in FIG. 32.

40       Once linked to an Internet article, a user is taken to a separate web browser from which  
he or she may navigate the web. FIG. 34 is an example of an Internet site to which a user  
might get connected upon selection of the world wide web option 182 of FIG. 32.

45       Furthermore, users have access to a pull-down menu by clicking the menu icon 184.  
From this menu, users can select various educational topics germane to the user's condition.  
For instance, an article available through the pull-down menu may teach a user suffering from  
a chronic cardiac condition how to determine his or her target heart rate zone, as shown in  
FIG. 35.



1 Users may also do key word searches to access and print articles of interest, to view  
featured video clips, or listen to audio clips.

Referring again to FIG. 8, the village store 78 and travel agency 82 are two additional  
interfaces accessible to users. Upon entering the store 78, users are taken to an in-house or  
5 third-party web site through which they may order relevant items, either on-line or by  
telephone.

Users may also search the store database and view product information, including  
pictures, descriptions, and prices of products. Moreover, users may view the status of their  
orders and contact customer service via e-mail or telephone.

10 Similarly, when a user enters the travel agency 82, he or she is linked to a third-party  
co-branded reservation system. FIG. 36 illustrates the inside of travel agency 82. From here,  
a user may make on-line travel reservations by selecting a Reservations option 202. A user  
may also view the frequent flier miles he or she has accrued so far by selecting a Check  
Reward Points option 200. As discussed above, a user may gain frequent flier miles by good  
15 participation in the program and reaching certain milestones.

Although the user-interface for clinical and wellness group members has been described  
in terms of a village motif, an alternative user-interface could incorporate another alternate  
embodiment of the system interface shown in FIG. 37. A multi-frame screen is shown which  
includes: a main navigation area 210; content area 212; message or video screen area 214; and  
20 an instructions area 216. The message or video screen area 214 may be used to show  
advertisements. The instructions area 216 may be used as a "What's New" area or for the  
bulletin board functionality discussed above for the kitchen 150A (FIG. 22), gymnasium 71  
(FIG. 26), and tranquility park 72 (FIG. 29) interfaces.

FIGS. 38-47 and 49-58 illustrate user interfaces for the case advisor and HMO, some  
25 of which are also accessible by the patient. Unlike the user interface for patients, the  
navigation for the physician/case advisor is generally less graphical and more chart oriented.

Referring now to FIG. 38, a log-on screen 220 for the user interface for a  
physician/case advisor is shown. The screen 220 requires the physician or case advisor to  
input their name 222 and corresponding password 224. Screen 220 thus acts as a security  
30 measure by ensuring that only legitimate users are able to gain access to the system.

Referring to FIG. 39, an initial screen containing a main menu 230 of the options  
available to the physician/case advisor follows the log-on screen 220. A Design Program For  
Patient option 232 allows a physician/case advisor to create a new program or modify an  
existing program for a patient, as described above in conjunction with FIGS. 3-6.

35 A second option within the main menu 230 is a Review Patient Record option 234  
which allows a physician/case advisor to review the health record of a particular patient.

A list of current patients (not shown), substantially similar to the list shown in FIG. 4  
follows upon selection of a Review Patient Record option 234.

1 Referring now to FIG. 40, a health record of an exemplary patient is shown. The record may provide identifying information, including the patient's name 240, subscription ID 242, and social security number 244. Furthermore, information as to the total amount of time that the patient has been participating in the program may be given as shown at 246.

5 Column 258 shows the patient's vital signs and other health-related factors, such as blood pressure 250, number of cigarettes smoked per day 252, amount of physical activity 254, weight 256, and cholesterol level 258. Some of these factors may be monitored and reported on a weekly basis, as shown in columns 260-268. Other factors, such as the patient's cholesterol level 258, may be monitored and reported on a bi-weekly basis, as shown in  
10 columns 260, 264, and 268. The ultimate goal to be achieved in each of the specified areas is given in column 272.

A list of the risk factors which may affect the patient's recovery may further be pinpointed as shown at 270.

Vital signs may be represented graphically for the patient, physician and case advisor.  
15 These may include charts or graphs of the patient's blood pressure 250A (FIG. 41), physical activity 254A (FIG. 42), weight 256A (FIG. 43), and cholesterol level 258A (FIG. 44). These graphs allow the physician/case advisor to review and grasp the patient's progress visually over a period of time, and help him or her determine how the patient is doing in relation to the ultimate goals that are to be achieved in the charted areas.

20 Referring again to FIG. 40, a physician/case advisor is also given an option 274 to assess the patient's behavior. Upon selection of this option, the system provides a behavioral change assessment form 305 like the one shown in FIG. 45. This form 305 is used to determine how inclined the selected patient is toward complying with the recommended program. In the preferred embodiment, on-line questionnaires are submitted to the patients,  
25 asking them to rate their behavioral intention 300, self-efficacy 302, and social support 304. Alternate forms of evaluation may also be used to assess the likelihood of a patient's compliance with the program.

The system periodically assesses and reports the patient's behavioral change as shown in columns 306 and 308. The desired goals 310 are also listed to monitor whether the patient  
30 is making progress towards them. If a patient continues to score low on the behavioral change assessment form 305, this may indicate that he or she is unable to change his or her lifestyle, and lead to the conclusion that the patient should be taken off the system.

The system generates reports on patient progress based on the data shown in FIGS. 40-45, as frequently as the physician desires. These reports can be received via either  
35 e-mail or facsimile. The frequency of reports will depend on the needs of the particular patient, and may be triggered by the achievement of goals or the setting off of alarm signals as described above.

1       The system can also generate regularly scheduled reports for a physician's review on a default basis, depending on a patient's needs. For example, patients who are relatively ill can be reviewed twice a week or more, even if no warning signals occur.

5       Upon receiving feedback from the system regarding changes to a patient's behavior modification program, a physician or case adviser may want to make recommendations about the program. FIG. 46 shows an exemplary recommendation screen which follows the selection of a Recommend 276 option of FIG. 40. If, for example, a patient initially placed on a program of walking 15 minutes three times a week loses 5 pounds and lowers his or her blood pressure, the system might generate a report to the physician recommending an increase  
10       in the patient's walking time to 45 minutes per session as shown at 322. The system may further make recommendations as to the frequency and duration of stress reduction exercises 328 as well as on other areas of the program as shown at 326. The physician reading the report can accept 330 or modify 332 the recommendations.

15       The system's reporting features enable a physician to handle more patients in the same amount of time without decreasing the quality of care. The system also allows for a patient feedback loop independent of this self-monitoring capability. If the patient has a difficult night, for example, he or she can send an e-mail through the system directly to the case advisor or the physician via the mail 98 (FIGS. 9, 16-20) or post office 74 (FIG. 8) interfaces.

20       Once the physician/case advisor is satisfied with the recommendations, he or she may electronically communicate 334 program changes to the subscriber.

      FIG. 46 also shows an example of a patient who has earned reward points 324 for not having smoked for 60 days. The reward points shown here are to be cashed in at the village store 78 shown in FIG. 8.

25       Referring to FIG. 47, the system presents a message screen upon the selection of a communications 334 option of FIG. 46. The case advisor may send the recommendation 346 made by the system and reviewed and/or modified by the physician, to the subscriber 340 with an attached audio e-mail message 344, or alternately via text e-mail or facsimile. A copy of the recommendation 346 and message 344 may also be stored in the system's database 342.

30       Physicians/case advisors may further communicate with patients by video conferencing. An existing third-party video conferencing package may be integrated to the system to allow the video conferencing feature. The minimal requirements for a PC to support the video conferencing capability is a clock cycle of 90 megahertz, 24 megabytes of random access memory, a color camera, a video capture board, an audio board, a video input capture board, and an ISDN line. The technical specification may change as technology affecting bandwidth  
35       and/or data compression changes.

      As shown in FIG. 47, the video conferencing feature may be accessed upon selection of a video conferencing option 347. A video conferencing manager, like one illustrated in FIG. 48 may then be used to conduct the video conference.

1 A health plan payor, such as an HMO, insurance company, or self-insured employer,  
may also access the system. Information that is released by a patient may also be sent  
electronically to the health plan payor. The information can then be combined with the  
5 provider's information to analyze individual patients or aggregate results of all people on the  
program. The analysis may include, for example, cost per patient, cost for patients in each  
category or group, and physician utilization. The system's relational database that allows for the  
custom gathering of data, depending upon the requirements of the health plan. The system may  
also provide aggregate reports to the health plan payor for management review and cost  
10 control purposes. A health plan payor may be less interested in looking at individual patient  
files and more interested in looking at information as to the number of subscribers on the  
system, the cost of keeping the subscribers on the system, and how this cost compares to that  
incurred by patients who are not on the system. At the same time, several layers of electronic  
security measures insure the individual patient's privacy by strictly segregating the type of  
information available to the various parties who have access to the system.

15 The user interface for the health plan payor is similar to the user interface used by a  
physician/case advisor. When the health plan payor signs onto the system, a main menu  
screen with a list of options available is provided, as shown in FIG. 49. From here, the payor  
may choose to view overall compliance status 350, perform case management review 352,  
perform an utilization review 356, review outcomes 354, or communicate 358, each of which  
20 options is described in further detail below.

Upon selection of a view compliance status 350 option, the health payor views current  
compliance status based on pre-determined categories 360, as shown in FIG. 50. For each  
category, information as to the total number of eligible patients 364, number of participating  
patients 366, participating patients complying with the program 368, participating patients put  
25 on probation due to lack of compliance 372, and patients terminated 376, may be displayed.

A comparative cost analysis screen is also invoked via a view comparative costs option  
362. FIG. 51 shows an example of the cost of maintaining patients on the system. The total  
cost 380 may be compared against costs incurred by a control group of patients who have not  
subscribed to the system 382. Comparative savings achieved by use of the system are shown  
30 in column 384.

Referring back to FIG. 49, the main menu 348 also includes a perform a case  
management review 352 option. A list of current patients (not shown), substantially similar  
to the list shown in FIG. 4, follows selection of this option.

35 Once a patient file has been selected, a confidentiality waiver information 390 is  
displayed, as shown in FIG. 52. A patient will be assured confidentiality and privacy in the  
areas where waiver has not been given. For instance, portions of the patient's journal will be  
kept confidential and unavailable to the health plan payor, ensuring that patients remain open  
and honest in making daily journal entries.

1        Upon selection of a continue option 392, a screen similar in content to the screen  
shown in FIG. 40 is shown in FIG. 53. As with the user interface for physicians/case  
advisors, indications of the patient's blood pressure level 404, physical activity 406, weight  
408, and cholesterol levels 410 over time, are given. These may also be represented  
5 graphically to the health plan payor in a form substantially similar to FIGS. 41, 42, 43, and  
44 respectively.

A health plan payor, however, has a review costs option 400 which is not available to  
a physician/case advisor.

10        FIG. 54 illustrates an exemplary screen viewable upon selection of the review costs  
option 400 of FIG. 53. Shown here is information as to the costs incurred to date in  
maintaining the selected patient on the system. The system costs 410, health service costs  
412, and total costs 414 are represented in a bar graph format in this particular example. The  
cost incurred by a control group patient who is not on the system is also shown 418. This  
cost is compared to the total costs 414 and the amount of savings 416 thus achieved, and is  
15 also displayed in a bar graph format.

Referring back to FIG. 49, another option provided by the main menu 348 is a review  
outcomes 354 option, which provides a screen like the one shown in FIG. 55 with information  
as to the various patient outcomes, based on various pre-determined categories. For instance,  
information as to the percent of compliant subscribers who had an emergency room ("ER")  
20 visit 420 is shown. This information may be compared against ER visits made by non-  
compliant subscribers 422 and control group patients who have not subscribed to the system  
424.

Referring back to FIG. 49, the main menu 348 also provides for a utilization review  
356 option. As shown in FIG. 56, upon making this selection, a screen appears with  
25 information including the name of the group or facility using the system, this group or  
facility's specialty 432, the number of cases to date 434, the percentage of cases referred to  
the system 436, and how this percentage compares 438 to the targeted utilization percentage  
440.

30        Upon selection of a particular group or facility 442, the same type of information for  
the doctors within the selected group or facility 442 may be obtained, as shown in FIG. 57.

The main menu 348 in FIG. 49 further provides a communicate 358 option leading to  
FIG. 58. The health plan payor may send an audio e-mail 456, text e-mail 458, or fax 460  
to the case advisor 450, responsible physician 452, or subscriber 454 as shown here.

35        In this way, the system provides an on-going loop of compliance monitoring and  
feedback to help the patient make difficult lifestyle changes. Once the patient has achieved  
the desired goals, he or she can continue to use the system as a health maintenance or  
wellness program. An aim of the system is to educate and motivate patients to take control

1 of their lives and improve their health by modifying their behavior and changing their lifestyles.

FIG. 59 is a block diagram of the present system. It will be apparent to those skilled in the art that the invention described herein may be implemented on various platforms. In a preferred embodiment, however, patients, physicians, case advisors, and health plan payors have access to a PC 500 with a Pentium microprocessor. The PC 500 contains audio and CD-ROM 502 capabilities. However, a PC 500 may have other multimedia capabilities including video display and capture capabilities, microphones, etc. The PC 500 is further connected to a printer 504 for generating hard copies of any data accessible by the computer.

10 In a preferred embodiment, the operating system utilized by the PC 500 is a windows-based operating system, preferably Windows 95.

In the preferred embodiment of the invention, each PC 500 is electronically linked to network server 508 via the Internet 518. Contained in each server 508 is a transaction server 510, meeting server 512, "inner circle" server 514, and "outer circle" server 516. The transaction server 510 is utilized to handle secure purchases via the store 78 (FIG. 9) or travel agency (FIG. 36) interfaces.

The secure meeting server 512 is dedicated to implementing the meeting room 96 and coffee shop functionalities discussed in reference to FIGS. 9, 14, and 15. The secure "inner circle" server 514 is dedicated to handle sensitive data, such as medical records.

20 Other servers may be added as needed. For instance, there may be a separate media server to handle the audio and video functionalities of the system.

Communication via the Internet 518 is achieved in the preferred embodiment of the invention through telephone lines by means of a high-speed modem 506 connected to the PC 500. Alternatively, satellites, television cable systems, and ISDN lines may be utilized to access the Internet 518. Standard TCP/IP is utilized as the protocol to communicate between the servers 508 and a PC 500 via the Internet 518.

25 The network server 508 may be located at a health plan payor facility with an independent third party that acts as an Internet Service Provider or elsewhere. The servers 510-516 have access to one or more relational databases 522 (such as SQL) that contain all the health plan data, including information input to the journal and schedule book information. For example, pertinent information from a patient's journal will be uploaded to the server and downloaded to the physician and case advisor. Information provided by the physician will also be uploaded to the same server. System data will be downloaded to the case advisor on a periodic basis for review.

35 All the information needed by a user of the system is located in the databases 522 or on CD-ROM and/or DVD distributed to the users on a periodic basis, or, as technology permits, via streaming audio and video. For instance, in the presently preferred embodiment, the video and audio clips available to a chairperson 114 for conducting meetings (FIG. 14), or

1 via the kitchen (FIGS. 21, 22), gym (FIG. 26), tranquility park (FIG. 29), and library (FIG. 32)  
interfaces is located on CD-ROM or DVD. However, with the emergence of ISDN, cable  
modem, XDSL, and direct satellite delivery, it is anticipated that the system will be capable of  
sending streaming video and audio over the network.

5 There are three levels of security implementation to help achieve secure transmission of  
data to and from the servers 510-516, as well as to ensure that only authorized users may access  
the databases 522. User security for patients, physicians/case advisors, and health plan payors  
is assured by a two tier (user id and password) system. An example of such log-on screen is  
shown in FIG. 36.

10 Furthermore, a "cookie"-based code is used to monitor when users log in and out, and  
to keep track of how each user uses the system. This will, for example, allow the system to keep  
attendance at group meetings. If a user has missed a group meeting, the case advisor would then  
be able to follow up with him or her about the absence.

15 Referring back to FIG. 59, a firewall 520 is also provided at the server level to protect  
confidentiality of health plan data. Furthermore, encryption is furnished to ensure that  
communication between servers 510-516 and PCs 500 is secure.

20 A network administrator 524, who may be the case administrator or an independent third  
party, is also attached to the server 508. The network administrator subscribes all users to the  
system except for clinical or wellness group participants. Physicians or case advisors are  
responsible for subscribing clinical or wellness members. The network administrator is also in  
charge of maintaining the system's databases 522.

25 In the preferred embodiment, the system is constructed using the C++ programming  
language in conjunction with SQL 6.5, Cold Fusion, commercially available from Alaire  
Company, Visual Basic, commercially available from Microsoft Corporation), and HTML.  
Active X and Java components may also be invoked to handle the multimedia functions of the  
system.

30 It will be understood that the foregoing is merely illustrative of the principles of the  
invention, and that various modifications can be made by those skilled in the art without  
departing from the spirit and scope of the invention as defined by the following claims. For  
example, the system can be programmed in any number of programming languages besides C++  
code to achieve the underlying principles of the present invention. The screens can be  
reformatted to change their appearance, and many different data sets can be used for various  
patients with different chronic diseases.

## 1 CLAIMS

1. A method for monitoring compliance with a therapeutic behavior modification program, the method comprising the steps of:

5 providing a therapeutic behavior modification program having a series of milestones for a patient;

inputting patient data at prescribed times; and

10 correlating the patient's data using a microprocessor with the milestones in the therapeutic behavior modification program to determine whether the patient is complying with the program.

2. The method of claim 1 further comprising the steps of grouping particular data using the microprocessor and linking the data to a remote computer.

15 3. The method of claim 1 further comprising the step of using the microprocessor to provide graphical screens for encouraging the patient to comply with the therapeutic behavior modification program.

20 4. A therapeutic behavior modification program, compliance monitoring and feedback system comprising:

means, comprising a relational database and a microprocessor coupled to the database, for developing a therapeutic behavior modification program having a series of milestones for an individual;

25 means for monitoring the individual's compliance with the program including:

means for prompting the individual to enter health-related data;

means for correlating the individual's entered data with the milestones in the behavior modification program and generating compliance data indicative of the individual's progress toward achievement of the program milestones;

30 means, accessible to the relational database and microprocessor, for motivating the individual to comply with the program comprising an integrated system of graphical system interfaces, the motivating means including:

means for enabling the individual to review the compliance data;

means for providing health information to the individual from a remote source;

35 an electronic calendar integrated with the behavior modification program for signaling the individual to take action pursuant to the behavior modification program wherein the calendar accesses the relational database and integrates requirements of the program with the individual's daily schedule;



1 an electronic journal for enabling the individual to enter personal health-related information;

an electronic meeting room for linking the individual to a plurality of other individuals having related behavior modification programs for facilitating group peer support sessions for compliance with the program; and

5 means for providing motivational media presentations to the individual for encouraging the individual to comply with the program; and

a graphical electronic navigator operable by the individual to control the microprocessor for accessing different parts of the system.

10 5. The system of claim 4 wherein the means for developing the therapeutic behavior modification program comprises:

means for inputting preliminary health information relating to the individual;

15 means for presenting a plurality of suggested behavior modification programs containing suggested milestones generated as a function of the preliminary health information;

means for selecting one of the suggested behavior modification programs and altering the milestones to generate the individual's behavior modification program; and

means for loading the behavior modification program into the relational database.

20 6. The system of claim 4 further comprising means for providing the motivational media presentations to the individuals in the electronic meeting room as part of the group support sessions, thereby facilitating interactive group discussion about the presentations.

25 7. The system of claim 4 further comprising means for enabling the individual to select an avatar to represent himself or herself in the electronic meeting room.

8. A method for assisting an individual to comply with a therapeutic behavior modification program, the method comprising the steps of:

30 providing the therapeutic behavior modification program having a series of milestones for the individual;

inputting health data relating to the individual at prescribed times;

correlating the individual's health data with the milestones in the behavior modification program using a relational database and generating compliance data indicative of whether the individual is complying with the program;

35 grouping particular compliance data using a microprocessor and linking the data to a remote computer; and

1           motivating the individual to comply with the behavior modification program by:  
          providing medical information to the individual relating to the program;  
          presenting the individual with the compliance data to allow the individual  
5           to personally monitor compliance with the program;  
          signaling the individual to take action according to the program through an  
          electronic interface integrated with the individual's daily schedule;  
          providing remotely accessible group support sessions and motivational  
          media directed toward encouraging the individual to achieve the program milestones; and  
          enabling the individual to retrieve the medical information, compliance data,  
10           and scheduling signals, and participate in the group support sessions and view the  
          motivational media through a graphical electronic interface.

15           9.     The method of claim 8 wherein the step of providing remotely accessible group  
          support sessions and motivational media comprises presenting the motivational media during the  
          group support sessions to facilitate interactive group discussion about the presentations.

          10.    The method of claim 8 further comprising the step of selecting an avatar to  
          represent the individual during the group support sessions.

20           11.   A method for assisting an individual to comply with a computer implemented  
          behavior modification program, the method comprising the steps of:

          providing milestones in the behavior modification program to be achieved by the  
          individual;

          monitoring the individual's compliance with the program by:

25           obtaining health-related data of the individual at prescribed times;

          comparing the health-related data with the milestones for generating  
          compliance data indicative of whether the individual is complying with the program, and  
          encouraging the individual to comply with the program if the compliance data indicates lack of  
          compliance; and

30           comparing the health-related data against accepted medical protocols and  
          alerting the individual's physician or case advisor when a health-risk is present;

          educating the individual electronically on health topics germane to the individual's  
          condition and behavior modification program; and

          motivating the individual to comply with the behavior modification program by:

35           providing group support for the individual by electronically linking the  
          individual to a plurality of other individuals having related behavior modification programs;

          providing a reward to the individual when certain of the milestones are  
          reached;

1                   presenting the individual with the compliance data for enabling the  
individual to personally monitor compliance with the program;  
                  enabling the individual to enter comments germane to the behavior  
modification program in a computer-implemented journal; and  
5                   providing motivational multi-media presentations for encouraging the  
individual to comply with the program.

12.    The method of claim 11 wherein the step of obtaining the health-related data  
comprises the user providing the data through a computer-implemented journal.  
10

13.    The method of claim 12 wherein portions of the data in the journal are accessible  
to a physician.

14.    The method of claim 11 wherein the step of obtaining the health-related data  
comprises a physician obtaining the data from office visits by the individual to the physician.  
15

15.    The method of claim 11 wherein the step of educating comprises providing recipes,  
stress management strategies, and nutritional, dieting, and exercise information to the individual.

16.    The method of claim 15 wherein ingredients appearing on the recipes are  
downloaded automatically to an on-line shopping list.  
20

17.    The method of claim 11 wherein the group support is provided by a computer-  
implemented meeting room wherein the individual and the plurality of other individuals  
participate in on-line group meetings, the meetings comprising:  
25

          a chairperson for monitoring discussions and triggering multi-media presentations;  
and

          a means of representing the individual and the plurality of other individuals in the  
group meetings.  
30

18.    The method of claim 17 wherein a computer-implemented schedule book enables  
the individual to:

          view a list of on-line group meetings;  
          sign-up for a particular group meeting from the list of group meetings; and  
35           request automated reminders for reminding the individual of group meetings for  
which the individual has signed-up.

1           19. The method of claim 17 wherein the meetings further comprise a means for the individual for contacting the plurality of other individuals via telephone directly from the computer-implemented meeting room.

5           20. The method of claim 11 wherein the group support is provided by a computer-implemented mentoring area for mentoring and giving support to the individual by other more experienced individuals.

10           21. The method of claim 20 wherein no more than a predetermined number of the more experienced individuals may be present in the mentoring area at a single time with the individual.

15           22. The method of claim 11 wherein the group support is provided through electronic mail for facilitating communication with the physician, case advisor, or the plurality of other individuals having related behavior modification programs.

20           23. The method of claim 11 wherein the group support is provided through an electronic bulletin board wherein the individual posts messages and read messages posted by the other individuals having related behavior modification programs.

25           24. The method of claim 11 wherein the reward is rewards points for being redeemed for goods, frequent flier miles, or a symbolic reward commending the individual for good work.

30           25. A therapeutic behavior modification program, compliance monitoring and feedback system comprising:

35               means, comprising a relational database and a microprocessor coupled to the database, for developing a therapeutic behavior modification program having a series of milestones for an individual;

              means for subscribing an individual to the behavior modification program;

              means for monitoring the individual's compliance with the program including:

30               means for obtaining health-related data of the individual at prescribed times for input into a relational database;

              means for comparing the health-related data with the milestones in the behavior modification program for generating compliance data indicative of whether the individual is complying with the program, and encouraging the individual to comply with the program if the compliance data indicates lack of compliance; and

35               means for comparing the health-related data against accepted medical protocols and alerting the individual's physician or case advisor when a health-risk is present;

1 means for educating the individual electronically on health and medical topics  
germane to the individual's condition and behavior modification program;

means, accessible to the relational database and microprocessor, for motivating the  
individual to comply with the program including:

5 means for providing group support for the individual by electronically  
linking the individual to a plurality of other individuals having related behavior modification  
programs;

means for providing a reward to the individual when certain of the  
milestones are reached;

10 means for presenting the individual with the compliance data for enabling  
the individual to personally monitor compliance with the program;

means for enabling the individual to enter personal feelings and comments  
germaine to the behavior modification program into a computer-implemented journal; and

15 means for providing motivational multi-media presentations for encouraging  
the individual to comply with the program;

means for modifying the program based on the individual's progress; and

a graphical user interface for controlling the microprocessor for accessing different  
parts of the system.

20 26. The system of claim 25 wherein the means for developing the therapeutic behavior  
modification program comprises:

means for inputting preliminary health information relating to the individual;

25 means for presenting a suggested behavior modification program containing  
suggested milestones generated as a function of the preliminary health information and accepted  
medical protocols;

means for modifying the suggested behavior modification program to generate the  
individual's behavior modification program;

means for loading the behavior modification program into the relational database;  
and

30 means for giving access to the individual to the graphical user interface for  
controlling the microprocessor for accessing different parts of the system.

27. The system of claim 25 wherein the means for obtaining the health-related data  
comprises means of prompting the individual to input health-related information into a  
35 computer-implemented journal.

1           28. The system of claim 25 wherein the means of educating comprises means for providing recipes, stress management strategies, and nutritional, dieting, and exercise information to the individual.

5           29. The system of claim 28 wherein the means for providing recipes includes means for downloading recipe ingredients to a computer-implemented shopping list.

10           30. The system of claim 25 wherein the means for providing group support comprises means for providing on-line group meetings comprising:

              means for electronically viewing a list of group meetings available for participation;

              means for electronically registering for a particular group meeting;

              means for sending automated reminders for reminding the individual about the particular group meeting for which the individual is registered;

15           means for providing an electronic meeting room for the group meetings;

              means for monitoring discussion during the group meetings;

              means for triggering multi-media presentations during the group meetings;

              means for electronically representing the individual and the plurality of other individuals in the group meetings; and

20           means for contacting the plurality of other individuals via a telephone directly from the computer-implemented meeting room.

25           31. The system of claim 25 wherein the means for providing group support comprises a means for providing a computer-implemented mentoring area for mentoring and giving support to the individual by other more experienced individuals.

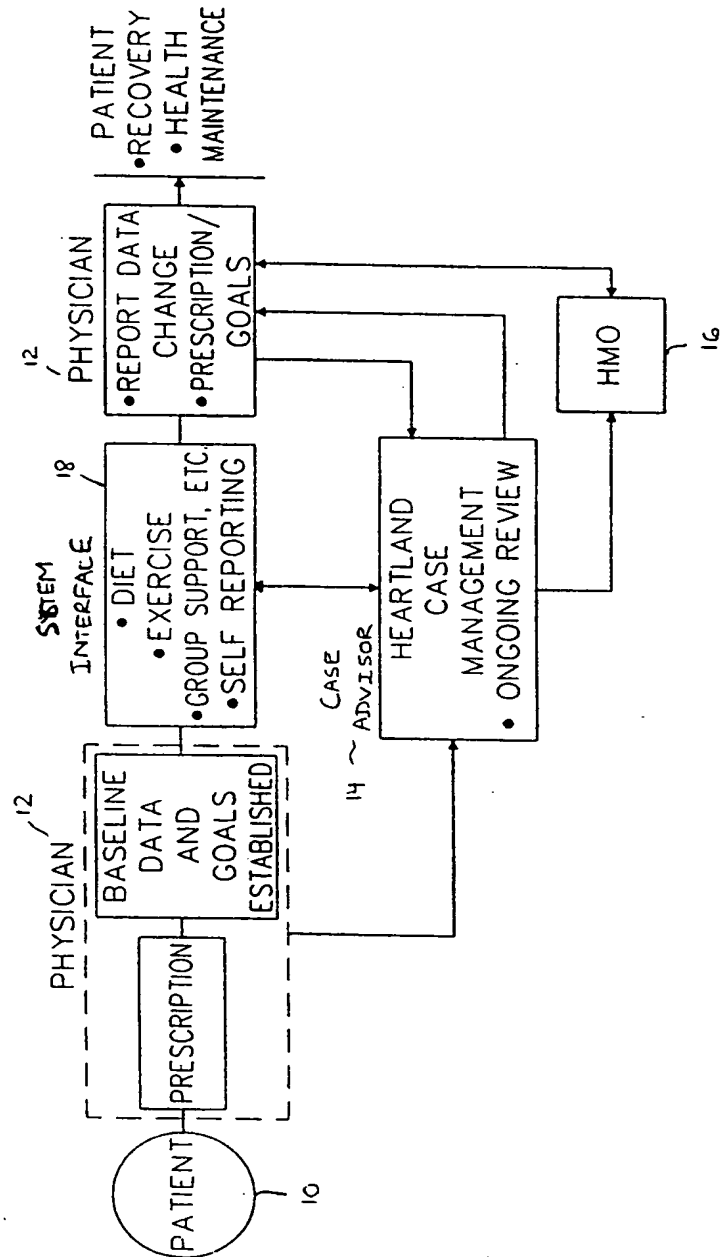
              32. The system of claim 25 wherein the means for providing group support comprises electronic mail means for facilitating communication with the plurality of other individuals.

30           33. The system of claim 25 wherein the means for providing group support comprises electronic bulletin board means for posting messages and reading messages posted by the other individuals having related behavior modification programs.

35           34. The system of claim 25 further comprising a means for providing security from unauthorized access to the system.

              35. The system of claim 25 further comprising a means for health plan payors for monitoring usage of the system.

Fig 1



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Fig 2

22 ~ **HeartLand Prescription Form**

23

Patient Name	Patient ID	Date	Physician Name	Physician ID

1. Fill in diagnosis:

Patient Diagnosis	Co-morbid Diagnosis

2 Circle a diagnostic category:

Category	Diagnosis	Level 1 (mos.)	Level 2 (mos.)	Level 3 (mos.)	Health and Wellness
I	Current year MI survivor	3	3	6	Contin.>12th month
II	Current year alt. to PTCA or CABG	3	3	6	Contin.>12th month
III	Current year diagnosed CAD	3	3	6	Contin.>12th month
IV	All diagnosed Angina	3	3	6	Contin.>12th month
V	Prior years' post MI/surgical--High Risk	3	3	6	Contin.>12th month
VI	Prior years' post MI/surgical--Low Risk	1	1	10	Contin.>12th month
VII	2 or more Risk factors	0	2	4	Contin.>6th month
VIII	Health and Wellness	0	0	0	Continuous

3. Please circle as appropriate:

30 { Does the patient need smoking cessation? Yes No  
Have you prescribed nicotine patch or gum? Yes No  
Does the patient need weight reduction? Yes No If yes, target weight: \_\_\_\_\_

32 ~ 4. What are patient's current and prescribed medications?

Medication	Standard Dosage	Comments/Changes
HCTZ	25 mg	
Atenolol	50 mg	
Lisinopril	20 mg	
Atorvastatin	20 mg	
Lovastatin	20 mg	
Antioxidant: Vitamin E	400 IU	
Antioxidant: Vitamin C	500 mg	
Other:		
Other:		
Other:		
Other:		

34 ~ 5. Circle or fill in desired 3-month targets:

Daily calories	1200	1500	2000	2500	3000
Sat Fat Grams	<15	15	18	20	25
Pct Fat Cal	10%	15%	20%	25%	30%
Exercise (Freq/wk/RPE)	20/5x/3	30/5x/4	45/5x/5	50/5x/6	60/5x/7
Max Heart Rate					
Stress Reduction Needs	Low Need	Some	Definite	High	Very High
Lipid Level Target					
Total Cholesterol	140	150	175	200	<225
LDL	60	70	80	<100	<125
HDL	35	37	39	41	>42

Physician's Signature: \_\_\_\_\_

Telephone: \_\_\_\_\_

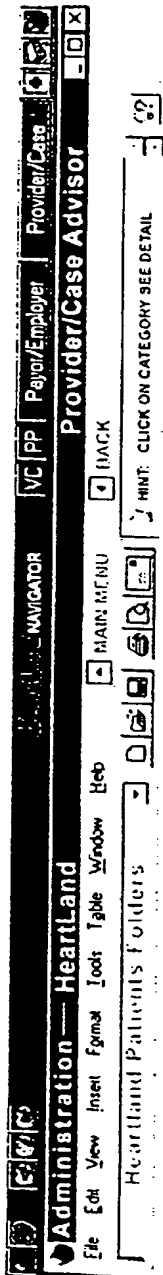
**FAX THIS FORM TO SALUS MEDIA: (805) 969-3601**

You will receive Fax confirmation within 24 Hours. For Assistance please call: (805) 969-2234

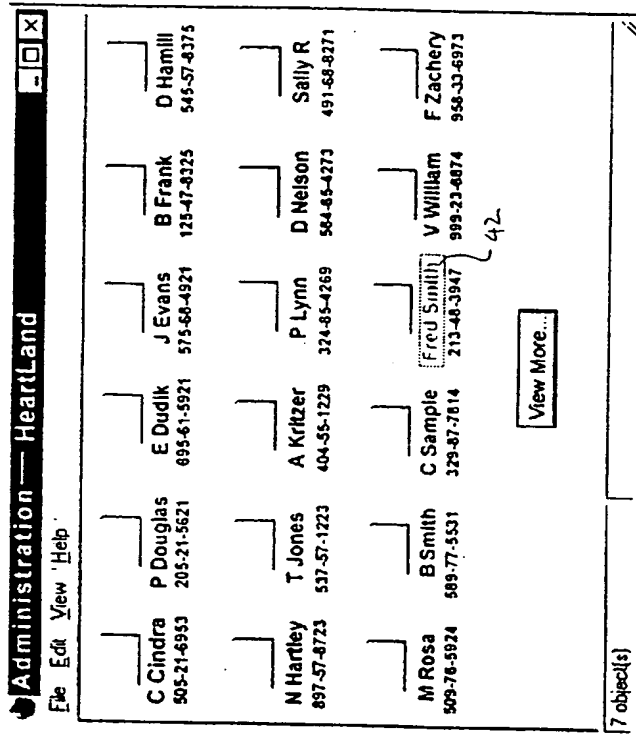


Fig 3

HeartLand 67



Click on the subscriber you wish to design a program for:



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HeartLand 68 Fig 4

HeartLand Health Assessment Review

Administration — HeartLand

File Edit View Insert Format Tools Table Window Help

NAVIGATOR VC PP Payer/Employer Provider/Case

Provider/Case Advisor

MAIN MENU BACK

HINT: CLICK ON CATEGORY SEE DETAIL

44 SCREEN 1 OF 3 48

PATIENT STATUS & GOALS: DETAILS		Now 2/10/98	1 month Goal	GOALS
Name / D.O.B.	Fred Smith 2-5-49			
Starting Date	2/1/98			
Heartland I.D.	23-842			
Height / Sex	5'9" Male			
Weight	193	182		
BMI	28.28	28.28		
Smoke	5 Packs/Day	5		
Physical Activity	0/0/0 minutes / x-week / RPE	20/3/3		
Alcohol	2 Average Drinks per Day	2		
Eating Habits	40 % Fiber/Complex Carb Intake	80		
	40 % Fatty Food Intake	20		
	40 % Fatty Dairy Intake	20		
Calories	3,600	3,300		
Fat Calories & %	45%	1,500		
Cholesterol - LDL	142	140 mg/dl		
Cholesterol - HDL	35	37 mg/dl		
Cholesterol	246 mg/dl	225		
Resting Pulse Rate	88 Beats Per Minute	68		
Stress	8.6 Scale of 1 to 10 (10 being high stress)	7.0		
Depression	Scale of 1 to 10 (10 being greatest)	10		
Blood Pressure	140/100 systolic/diastolic	140/100		
Seatbelt Use	30 percent of time	60		
Back Pain	Incidents per month	3		
Pharmaceuticals				
- aspirin	325 mg	325 mg/day		
- hydrochlorothiazide	12.5 mg	12.5 mg/day		
- Losartan	20 mg	20 mg/day		

EDIT DESIGN 50

HeartLand 69 Fig 5

Administration — HeartLand

File Edit View Intent Format Tools Window Help

HeartLand and Health Assessment Review

NAVIGATOR

VC PP Payor/Employer Provider/Case

BACK

HINT: CLICK BOX TO DESIGN PROGRAM

Provider/Case Advisor

SCREEN 2 OF 3

Design a new program for: Fred Smith Date: 3/10/98

Heartland I.D. #: 23-642 Social Security #: 213-48-3947

INITIAL SCALE

LOW INTENSITY HIGH

DIET 1 2 3

EXERCISE 1 2 3

STRESS MANAGEMENT 1 2 3

GROUP SUPPORT 1 2 3

DRUG COMPLIANCE 1 2 3

Based on your input, Heartland suggests the following program and goals for: Fred Smith

Diet	15%	Calories From Fat
Exercise	3/4 hr	days per week
Stress Management	1/2 hr	days per week
Group Support	1/2 hr	days per week
Compliance Mgt. Freq.	4	times per Month
Smoking		Cessation
Drug - aspirin	325	mg/da
Drug - hydrochlorothzid.	12.5	mg/da
Drug - Lovastatin	20	mg/da

Program Detail ~ 54

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HeartLand 70 Fig 6

HeartLand 70 Fig 6

Adminis: File Edit View

HeartLand Health Assessment Review

NAVIGATOR: VC PP Payroll/Employer Provider/Case

Provider/Case Advisor

MAIN MENU: BACK

HINT: CLICK ON CATEGORY SEE DETAIL

SCREEN 3 OF 3

Based on your Input, here is HeartLand's recommended program for: Fred Smith

Use the buttons to confirm or edit this program.

CONFIRM 63

EDIT 64

OPTIONS...

60

PATIENT STATUS & GOALS: DETAILS		Now 2/10/98	1 month Goal	GOALS
Name / D.O.B.	Fred Smith 2-5-49			
Starting Date	2/1/98			
Heartland I.O.	23-642			
Height / Sex	6'9" Male			
Weight	193			
BMI	28.28	182	175	170
Smoke	5 Packs/Day	28.28	26.64	25.00
Physical Activity	0/0/0 minutes / x-week / RPE	5	0	0
Alcohol	2 Average Drinks per Day	20/3/3	25/6/4	4/8/8
Eating Habits	40 % Fiber/Complex Carb Intake	2	1	1
	40 % Fatty Food Intake	60	70	80
	40 % Fatty Dairy Intake	20	20	15
Calories	3,600	20	10	5
Fat Calories & %	45%	3,300	3,100	2,800
Cholesterol - LDL	142	45%	20%	15%
Cholesterol - HDL	35	140 mg/dl	125 mg/dl	100 mg/dl
Cholesterol	246 mg/dl	37 mg/dl	39 mg/dl	45 mg/dl
Resting Pulse Rate	88	226	210	190
Stress	8.5 Scale of 1 to 10 (10 being high stress)	68	88	79
Depression	Scale of 1 to 10 (10 being greatest)	7.0	6.0	3.6
Blood Pressure	140/100 systolic/diastolic	10	6	0
Seatbelt Use	30 Percent of time	140/100	130/90	130/90
Back Pain	Incidents per month	60	75	100
Pharmaceuticals		3	2	0
- aspirin	325 mg	325 mg/day	325 mg/day	325 mg/day
- hydrochlorothal	12.5 mg	12.5 mg/day	12.5 mg/day	0 mg/day
- Lovastatin	20 mg	20 mg/day	20 mg/day	0 mg/day

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70                      Fig 7

## HeartLand Patient Progress Report

Date: April 2, 1997

Dear Doctor Cavello:

This is a status report on your patient, Fred Smith, SSN: 565-76-2334, Plan No. 011-066754

Your diagnosis was: non-complicated anterior MI and co-morbid diagnosis none,

Patient entered the HeartLand program on March 12, 1997. He/she has been on the program 3 weeks.

Progress toward goals:

Parameter	Current Status	Suggested Next steps	Target
Blood Pressure	146/92	144/90	140/90
Weight	172	170	170
Resting Pulse	67	65	65
Exercise Program	35 min/4x-wk/4 RPE	45 min/4x-wk/5 RPE	45 min/6x-wk/6 RPE
Total Cholesterol	210 mg/dl	200 mg/dl	190 mg/dl
LDL Cholesterol	125mg/dl	115mg/dl	100mg/dl
HDL Cholesterol	39mg/dl	42mg/dl	45mg/dl
Diet: Cal/day	3100	3000	2800
Sat Fat grams/day	20 g	15 g	10 g
Smoking Status	0 was: .5 pack/day	0	0
Aspirin	325 mg - missed 1/wk	325 mg - missed 0/wk	325 mg - missed 0/wk
HCTZ	12.5 mg. - missed 0/wk	1205 mg. - missed 0/wk	12.5 mg. - missed 0/wk
Lovastatin	20 mg. - missed 0/wk.	20 mg. - missed 0/wk.	20 mg. - missed 0/wk.
Other			
Other			

Please initial here to indicate you have reviewed this Status Report: \_\_\_\_\_

69 ~ Please initial here to indicate you agree with suggested next step targets: \_\_\_\_\_

Indicate any changes desired in Next Step Goals and Medications:

\_\_\_\_\_

\_\_\_\_\_

Physician's Signature: \_\_\_\_\_

Thank you,

Mary Quinn  
HeartLand Case Advisor

FAX THIS FORM TO SALUS MEDIA: FAX NO. (805) 969-3601

You will receive Fax confirmation within 24 Hours. For Assistance please call (805) 969-2234

8/60

Fig. 8

Heart Land 02

Heartland

76

74



78

80

82

86

84

9/60

Heartland 03 Fig 9

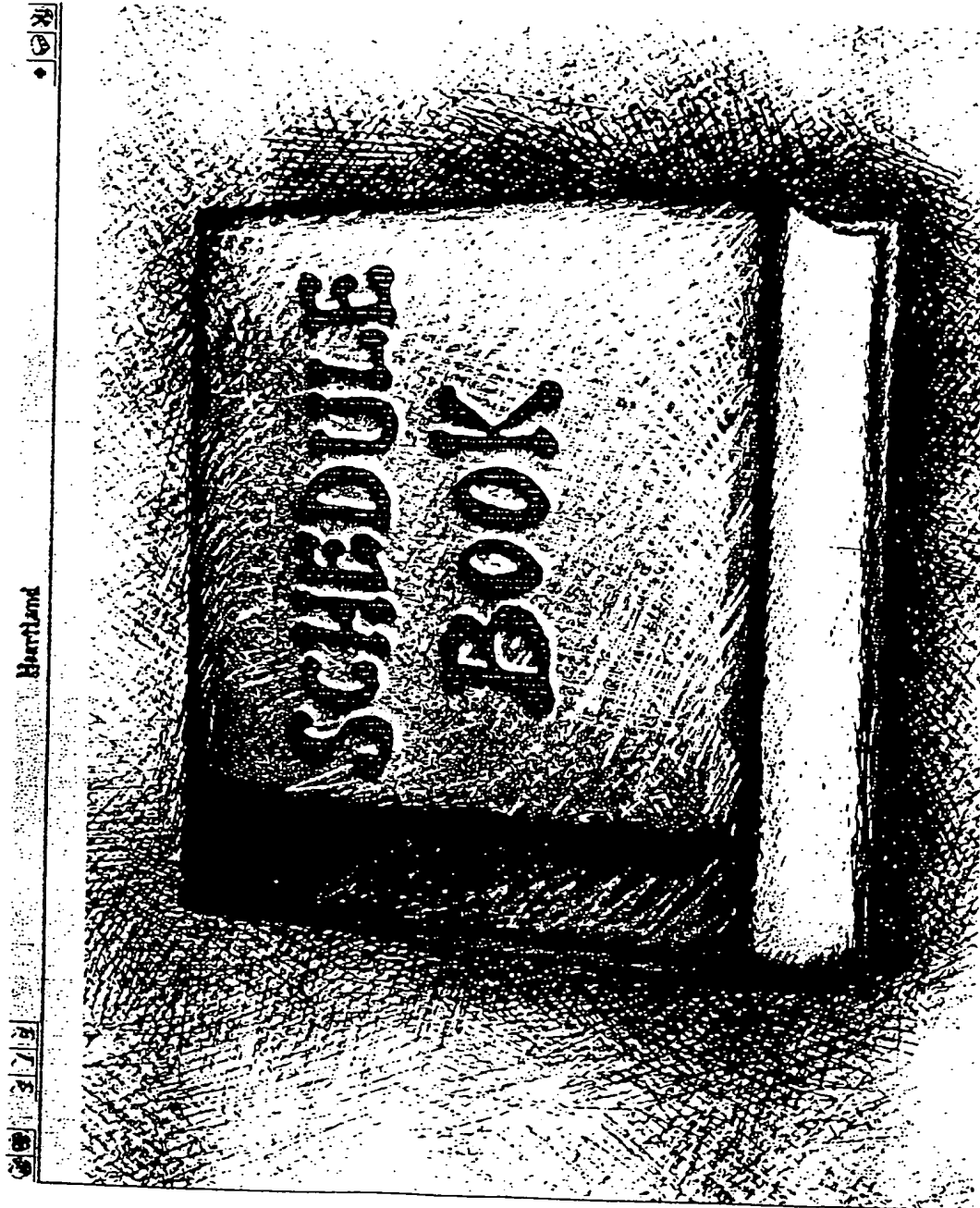


10/60

Fig 10

Heart Land 04

Heartland





11/60

Fig 11

Heartland 05

Heartland



TIME	GROUP	#	CITY	ACTIVITY
7:30 A.M.	Movies	4	LA, CA	Low
7:30 A.M.	Dog Lovers	15	LA, CA	High
7:30 A.M.	Porn-fictionist	18	NYC, NY	High
7:45 A.M.	Just for laughs	10	NYC, NY	Med.
8:00 A.M.	Spartans	12	Chicago, IL	Med.
7:30 A.M.	Travelers	5	LA, CA	Low
7:45 A.M.	Cool Set	8	LA, CA	Low
7:45 A.M.	Country Bunkers	12	INdian, IN	Med.
7:30 A.M.	City Shoppers	8	NYC, NY	Low
7:45 A.M.	K9'S	18	NYC, NY	High
8:00 A.M.	Water Babies	7	Dallas, TX	Med.

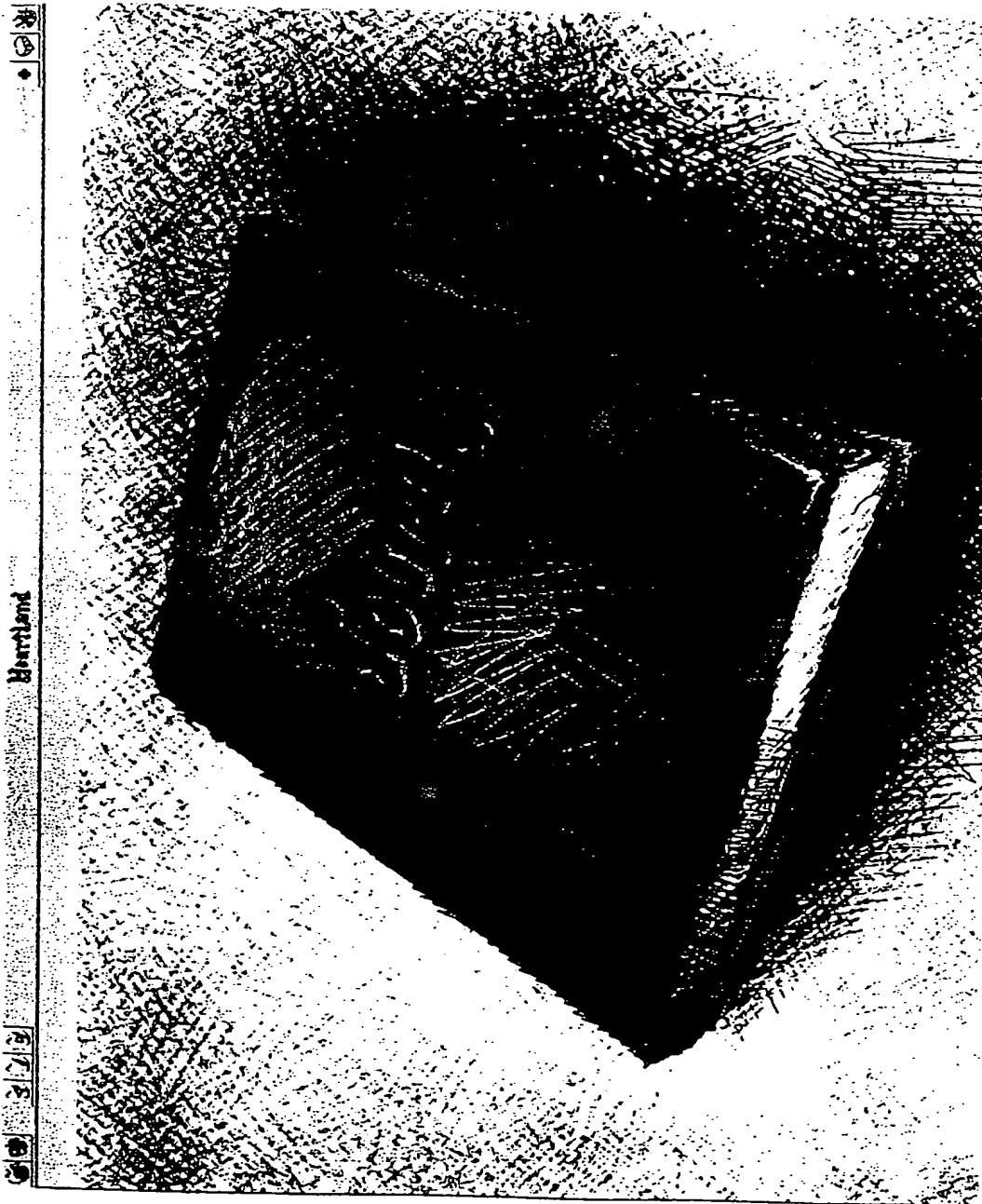
104

12/60

Fig 12

Heartland 06

Heartland



94A

13/60

Fig 13

Heartland 07

Heartland

Heartland 07		Heartland	
<p><u>EMOTICONS ~ 100</u></p> <p> <input type="checkbox"/> Happy  <input type="checkbox"/> Comprehending  <input type="checkbox"/> More confident  <input type="checkbox"/> confident  <input type="checkbox"/> committed  <input checked="" type="checkbox"/> Worried  <input type="checkbox"/> anxious  <input type="checkbox"/> scared  <input type="checkbox"/> Aware  <input type="checkbox"/> Growing  <input type="checkbox"/> Failing  <input type="checkbox"/> Drifting  <input type="checkbox"/> Angry  <input type="checkbox"/> Sad  <input type="checkbox"/> Depressed         </p>		<p><u>VITAL SIGNS ~ 102</u></p> <p>           Heart Rate 82            Blood Pressure 160/98            Cholesterol 230            Diet <input type="checkbox"/> Y <input type="checkbox"/> N         </p> <p><u>EXERCISE ~ 104</u></p> <p>           Walking Y <input type="checkbox"/> N <input type="checkbox"/>            Stretching <input checked="" type="checkbox"/> <input type="checkbox"/>            Stress Mgmt. <input type="checkbox"/> </p>	

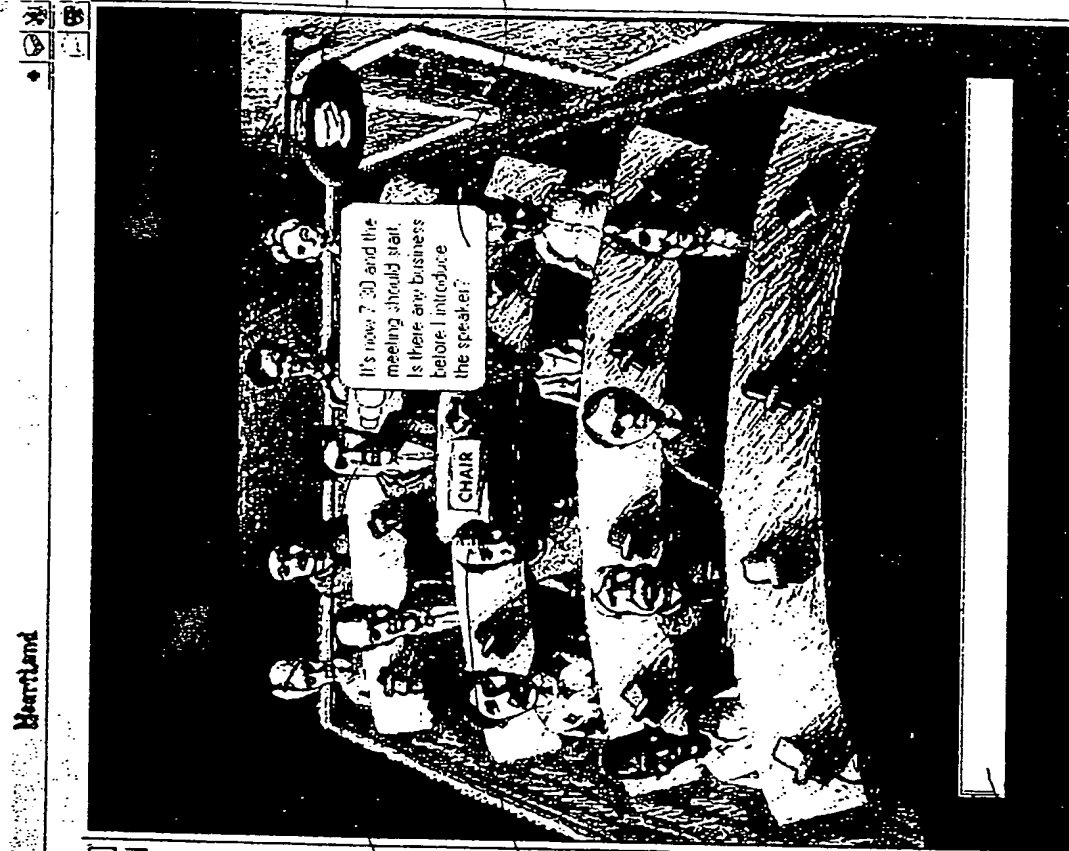
14/60

Fig 14

Heartland 13

96A

Heartland



Log Window

CHARPESON: Good morning  
CHARPESON: It's now 7:30 and the meeting  
should start. Is there any business before I  
introduce the speaker?

110

112

114

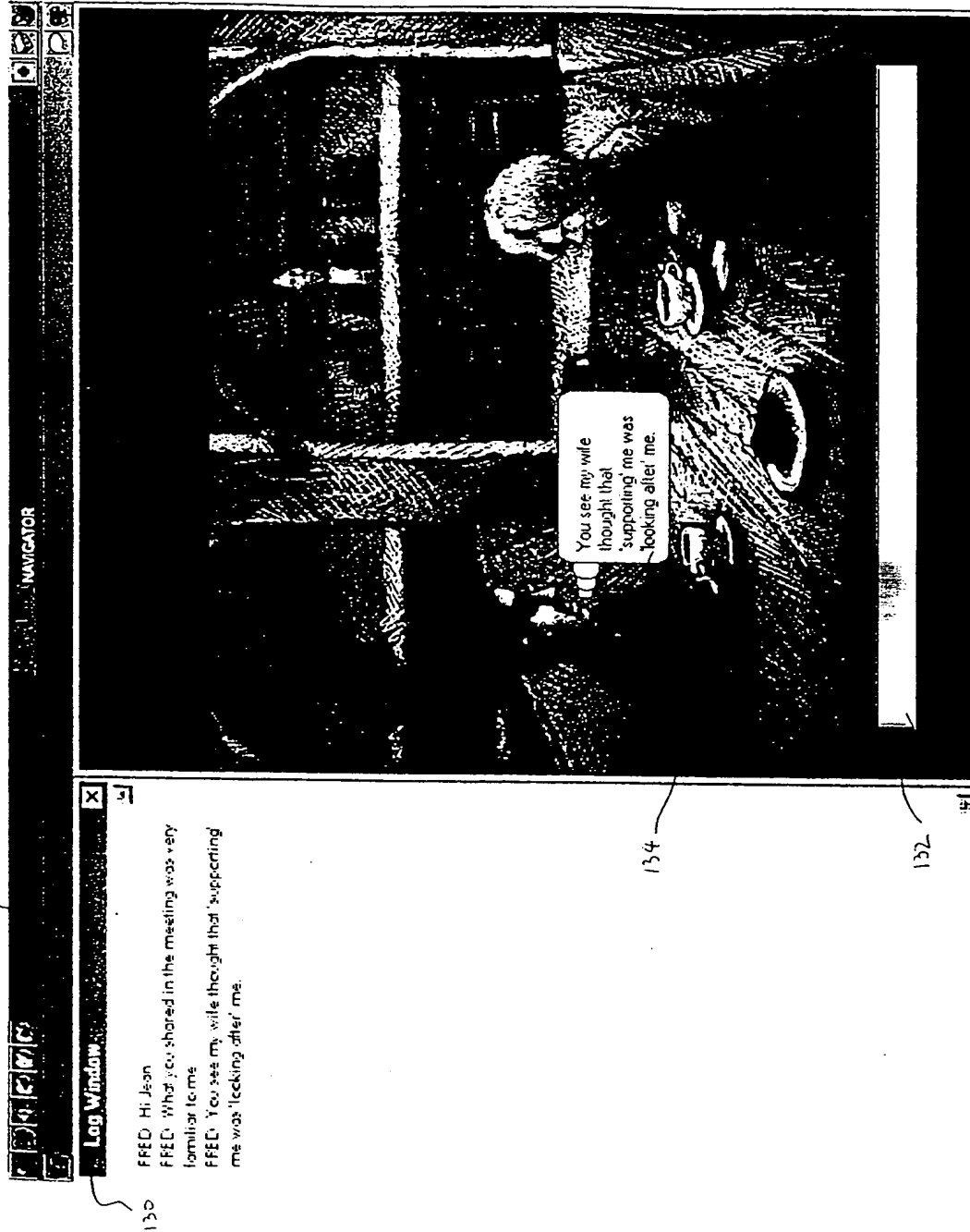
122

71A

116

Fig 15

76B



16/60

Heartland 08 Fig 16



17/60

Heartland on Fig 17

Heartland



# Heartland

mail service

FROM: Bill  
 DATE: 05-27-99  
 TIME: 9:00 am

Dear Martha,

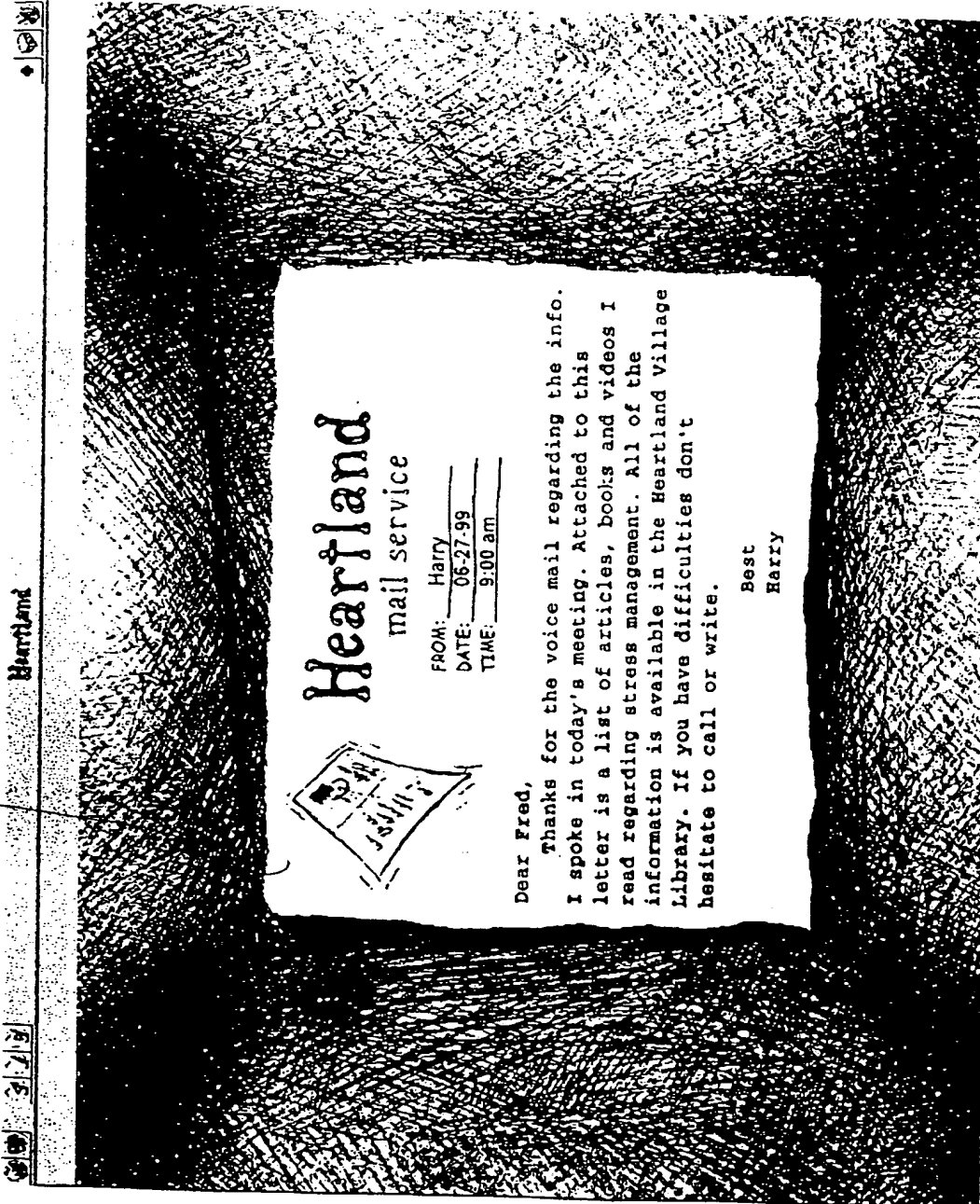
You spoke about a book which had helped you in dealing with the problem of maintaining a diet while traveling. I am not able to find it in the Library or in the travel agents. Would you please send me the title and author?

I was distressed to hear that your dog is not well. I have had doggy friends all my adult life and know just how attached one becomes. I will say a little prayer for "Patches" tonight and hope that by tomorrow's meeting he is improved.

Warmest regards  
 Bill

18/60

142b  
Heartland 10  
Fig 18

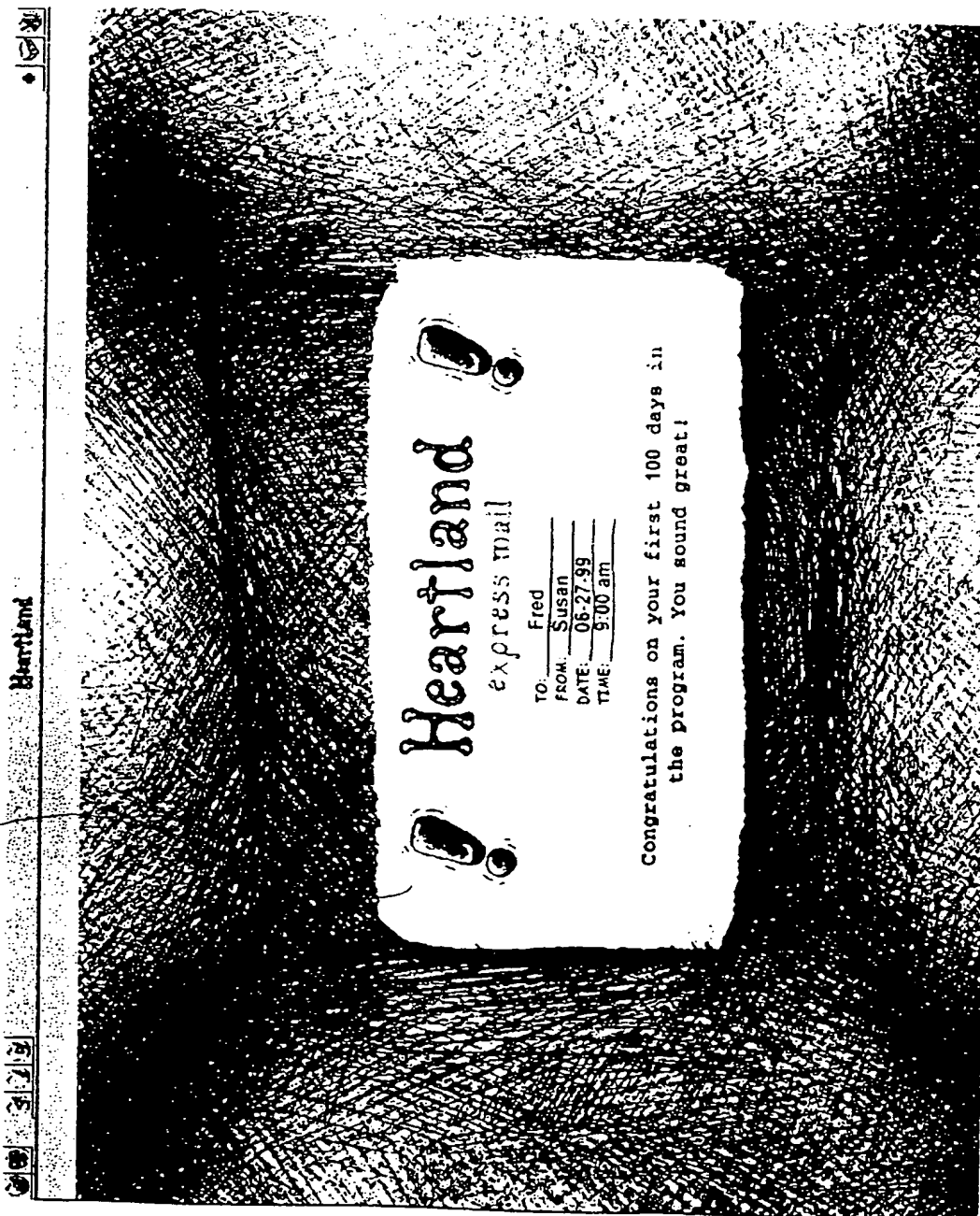


Mail



19/60

744A Heartland LJ Fig 19

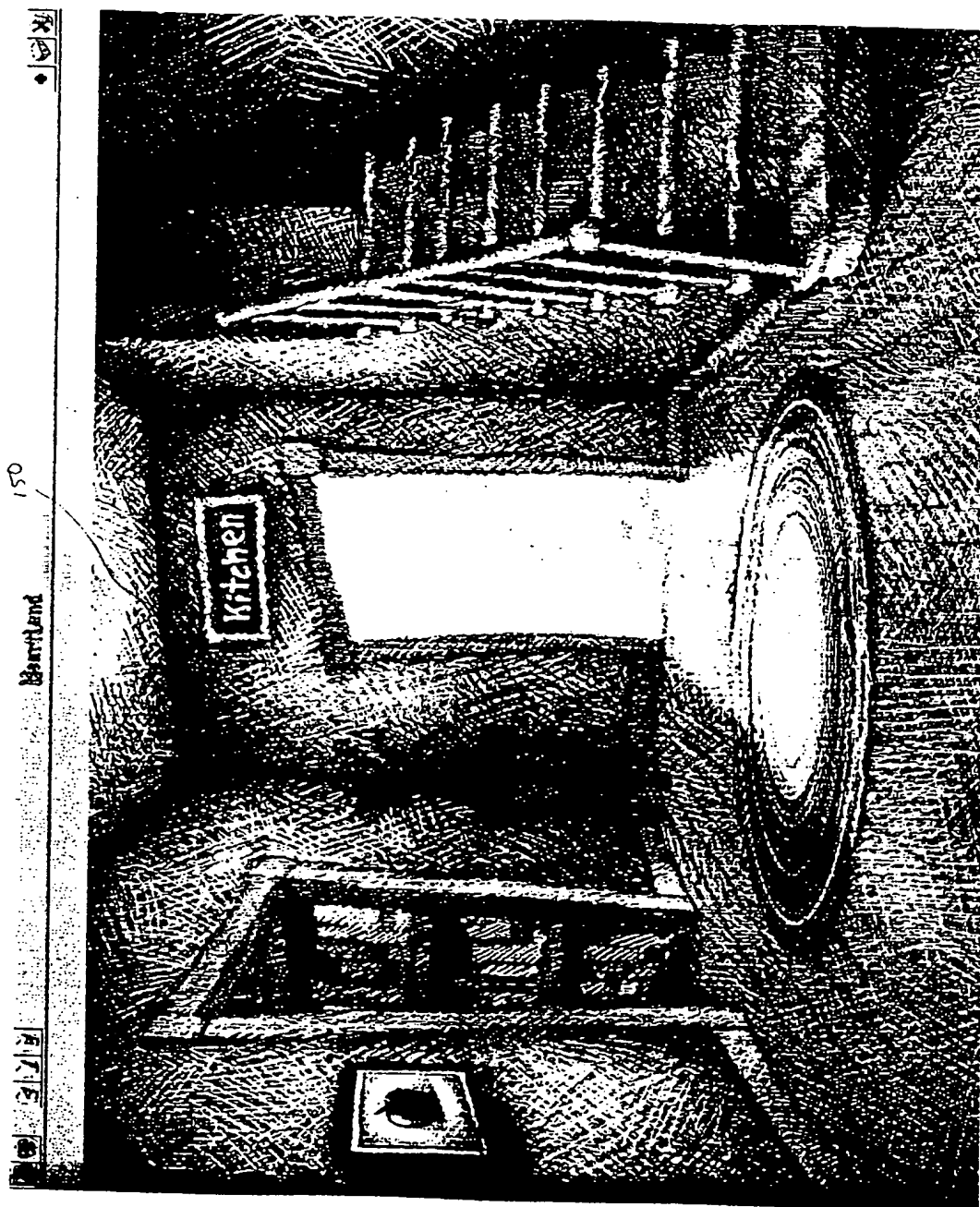


146A Heartland 12 Fig 20



21/60

HeartLand 23 Fig 21



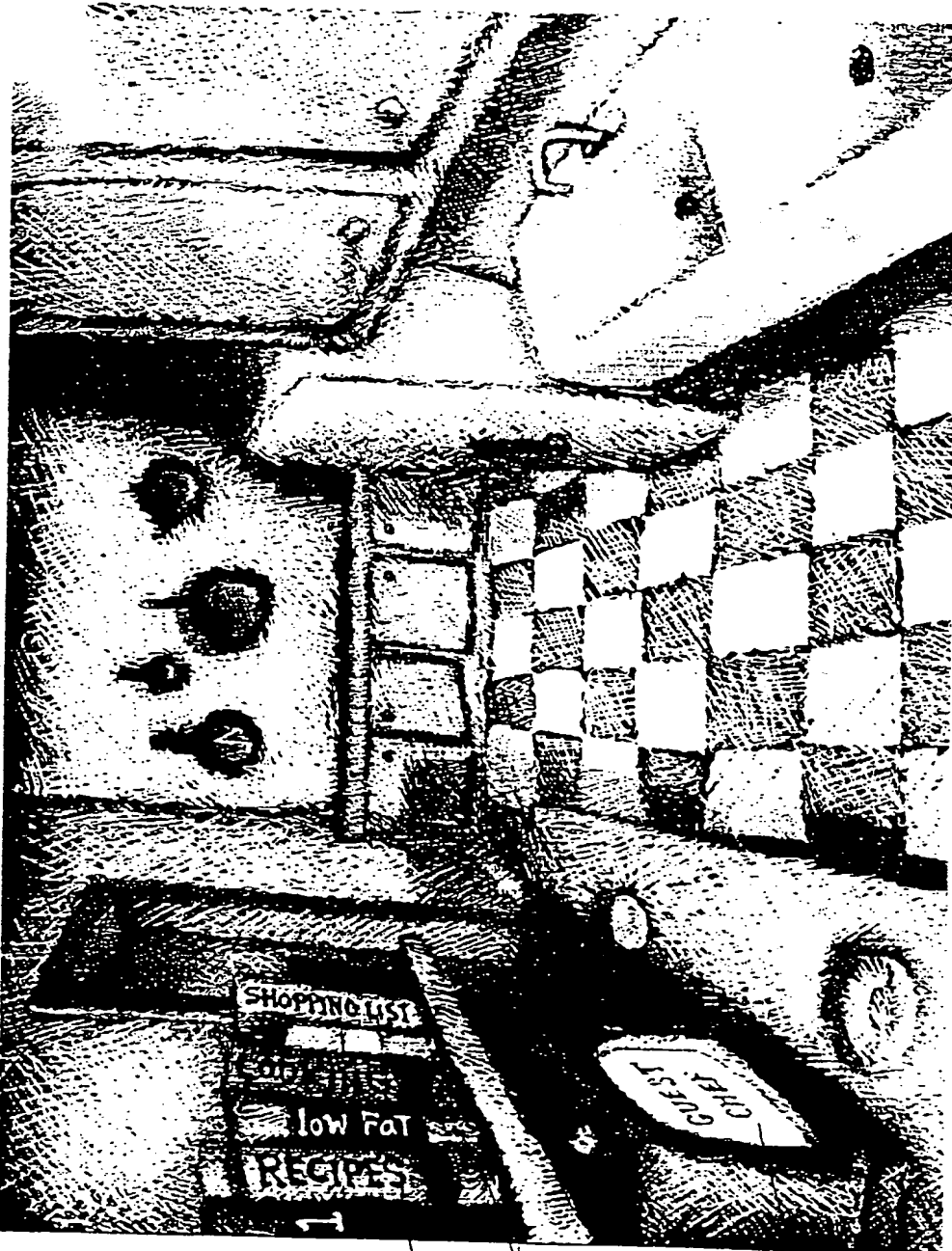
22/60

HeartLand 24 Fig 22

152

5/1/2

HeartLand



154

153

158

Heartland 25  
Fig. 23

NAVIGATOR

## Green Pepper-Corn Frittata

**Ingredients:**

- 1/4 cup olive oil
- 1 onion, sliced
- 1 large green bell pepper (capsicum), seeded, de seeded and sliced into thin strips
- 1/4 cup (4 oz/125 g) chopped pimientos (mild peppers)
- 1 1/2 cups (9 oz/250 g) corn kernels
- 1/4 teaspoon ground black pepper
- 1/4 teaspoon ground mustard
- 1 tablespoon grated Romano cheese
- 1/2 cup (4 oz/125 g) egg whites
- 1/4 cup (2 fl oz/60 ml) nonfat milk
- 1/4 teaspoon salt
- 1/4 teaspoon dried oregano
- 2 eggs
- 4 egg whites

**Preparation:** 20 minutes • **Cooking:** 30 minutes • **Serves:** 4

Bell peppers and corn are excellent sources of vitamin A, and peppers are rich in the antioxidant vitamin C as well. Both vegetables are in season from late spring through early autumn, giving you plenty of opportunity to make this quick meal over and over again.

Preheat an oven to 350°F (180°C). In a large ovenproof frying pan over medium heat, heat the olive oil. Add the onion and green pepper and cook until tender, about 5 minutes. Add the pimientos, corn and oregano and cook for 5 minutes. Transfer the vegetables into a medium bowl.


In a large bowl, combine the eggs, egg whites, milk, salt, pepper and mustard and whisk until blended. Add the egg mixture to the vegetable mixture.

In the same frying pan over low heat, pour in the egg-vegetable mixture. Cook, stirring frequently, until the eggs are firm on the bottom and almost set on the top, 8-10 minutes. Sprinkle the cheese on top and bake in the oven until the eggs are set, 5-8 minutes.

To serve, cut into 4 wedges and divide among individual plates.

**Nutritional Analysis per Serving**

Calories 160 (Kiljoules 670); Total fat 5g Saturated fat 1g Protein 11g  
Cholesterol 108mg; Carbohydrate 20g Sodium 537mg; Dietary Fiber  
Calories from fat 26%



24/60

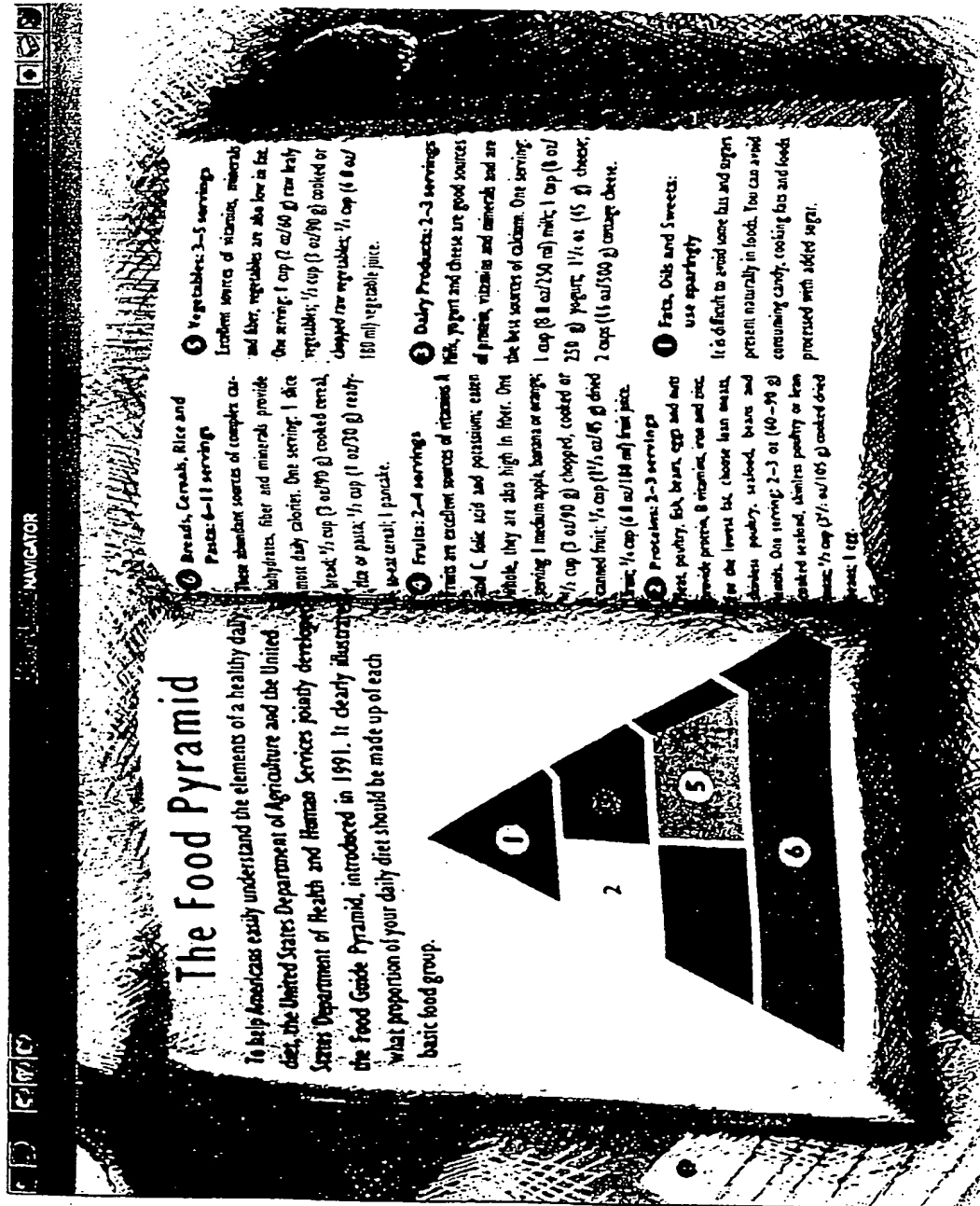
HeartLand 30 Fig 24

INDICATOR

## SHOPPING LIST OPRAH'S MENU #7

<u>VEGETABLES</u>	<u>MEATS</u>
2 Artichokes	4 lbs. Boneless Chicken Breast
3 Tomatoes	3/4 lb. Ground Turkey
1/4 lb. Mushrooms	1/2 lb. Fillet of Sole
2 Onions	
3 Zucchini	<u>DAIRY</u>
2 Potatoes	1 qt. Low-Fat Cottage Cheese
1/2 lb. Green Beans	1 qt. Non-Fat Yogurt
2 Bell Peppers	1 qt. Non-Fat Milk
2 Heads Lettuce	
<u>FRUITS</u>	<u>OTHER</u>
3 Apples	1 Sour Dough Bread
3 Oranges	1/2 lb. Box Rice
3 Bananas	1 box Oat Meal
1/4 lb. Strawberries	1 box Grape Nuts
1/4 lb. Blueberries	1 box Whole Wheat Spaghetti
1/4 lb. Raspberries	
1 Cantaloupe	
1/2 Watermelon	

HeartLand 27 Fig 25



Heartland 4 Fig 26

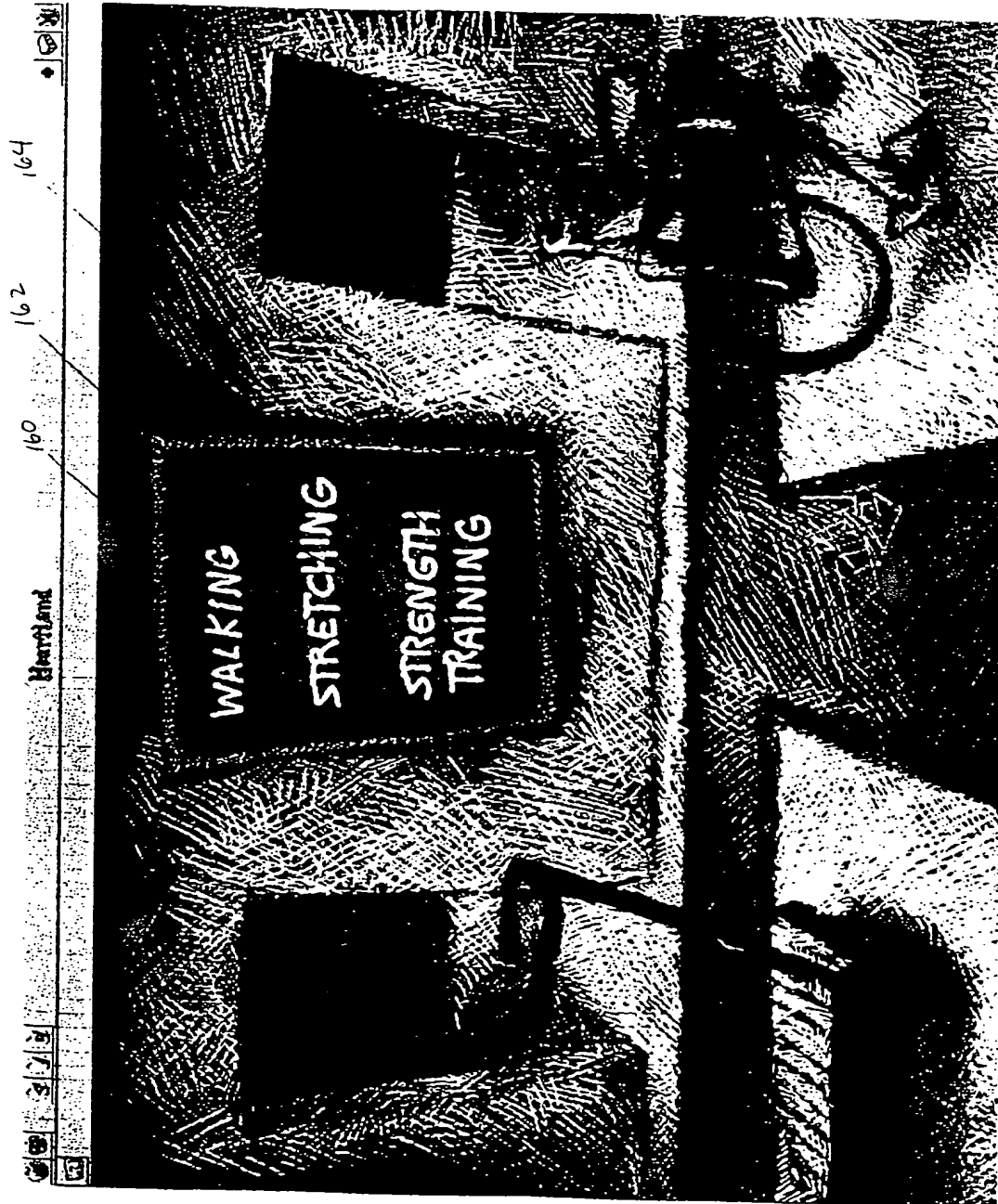


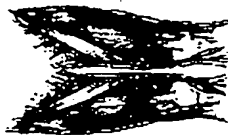


Fig 27

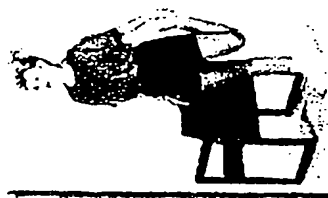
Heartland 18

Heartland

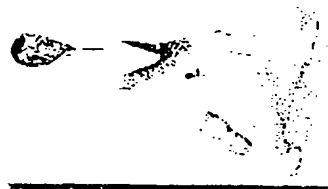
**INNER THIGH,  
QUADRICEPS,  
AND HIP MUSCLES**



Hip muscles  
need to be  
stretched to  
help avoid  
low back  
pain.



**Quadriceps Stretch**  
*Bring foot back toward gluteals*



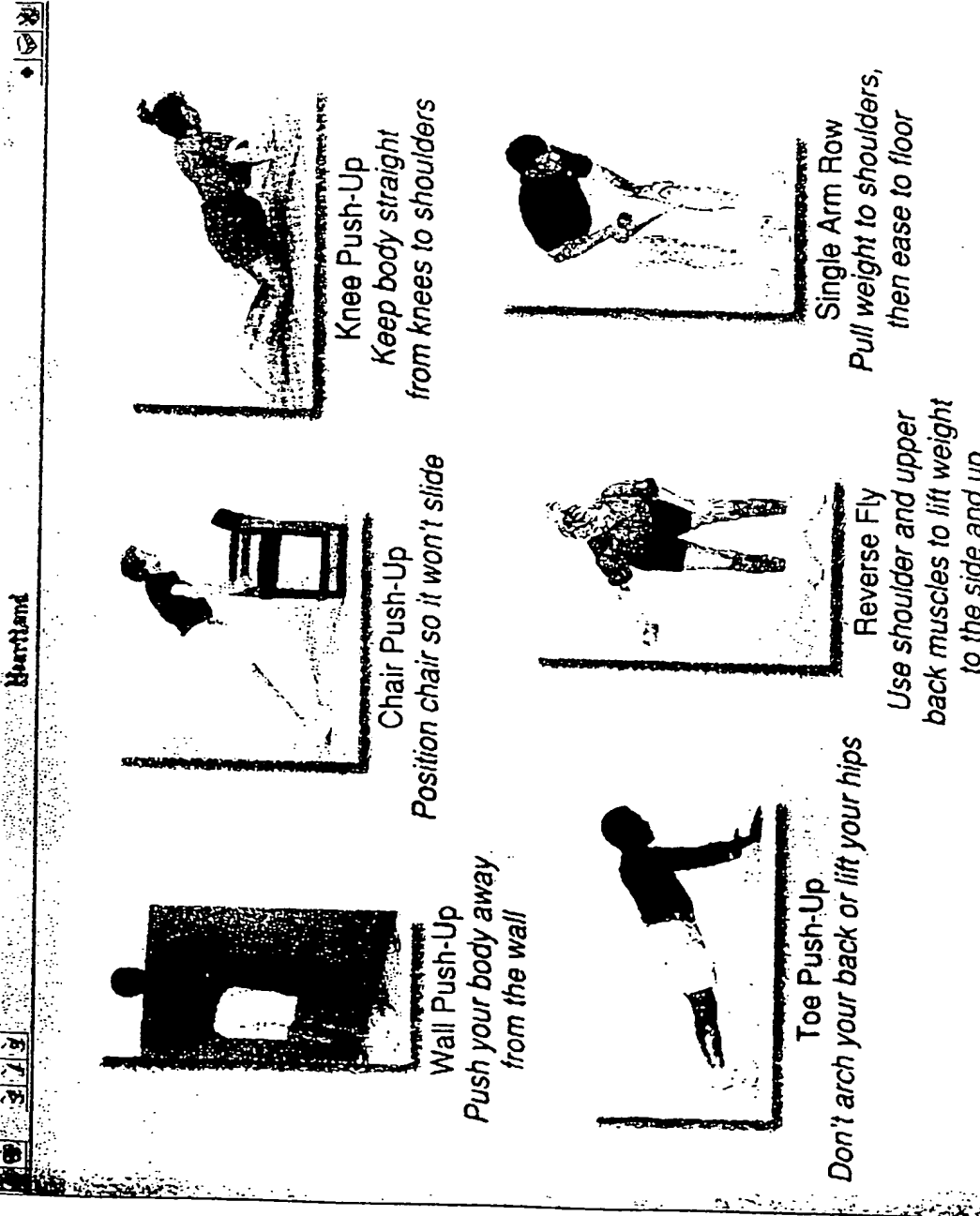
**Standing Lunge**  
*Keep knee in line  
with foot*



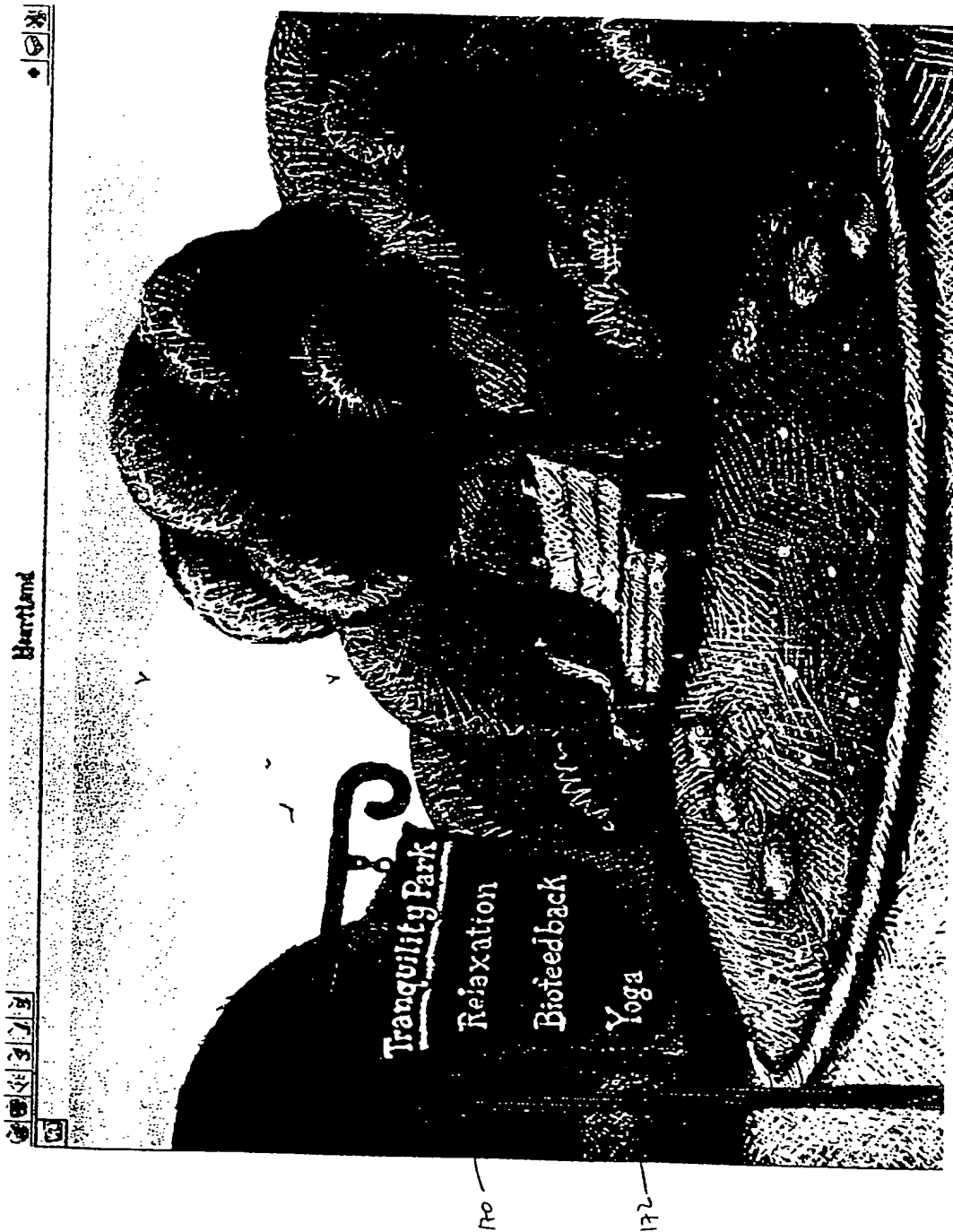
**Butterfly**  
*Lean forward gently*

fitness


Heartland 15 Fig 28



Heartland 19 Fig 29



Heartland 2) Fig 30



## Creating Your Sanctuary

**O**ne of the first things you should do when you start using creative visualization is to create a sanctuary within yourself where you can go anytime you want to. Your sanctuary is your ideal place of relaxation, tranquility, and safety, and you can create it exactly as you want it.

*Close your eyes and relax in a comfortable position. Imagine yourself in some beautiful natural environment. It can be anyplace that appeals to you . . . in a meadow, on a mountaintop, in the forest, beside the sea. It could even be under the ocean, or on another planet. Wherever it is, it should feel comfortable, pleasant, and peaceful to you. Explore your environment, noticing the visual details, the sounds and smells, any particular feelings or impressions you get about it.*

*Now do anything you would like to do to make the place more homelike and comfortable. You might want to build some type of house or shelter there, perhaps just surround the whole area with a golden light of protection and safety, create and arrange things there for your convenience and enjoyment, or do a ritual to establish it as your special place.*

*From now on this is your own personal inner sanctuary, to which you can return anytime just by closing your eyes and desiring to be there. You will always find it healing and relaxing to be there. It is also a place of special power for you, and you may wish to go there every time you do creative visualization.*

*You may find that your sanctuary spontaneously changes from time to time, or that you want to make changes and additions to it. You can be very creative in your sanctuary and have a lot of fun there . . . just remember to retain the primary qualities of peacefulness, tranquility, and a feeling of absolute safety.*

Fig 31

Heartland 20

Heartland

## Final Relaxation

When you practice will help you to be more in touch with your body, able to recognize tension and relaxation and thus to bring them under your conscious control. At the end of a session of asanas, you should spend at least ten minutes in Final Relaxation. During this time, you relax each part of the body in turn. But in order to experience relaxation, you must first experience tension. Working up from the feet, as shown below, you first tense and lift each part, then drop (but don't place) it down. Now let your mind travel throughout the body, commanding each part to relax. Let yourself go. Sink deep into the quiet pool of the mind. To bring your consciousness back to your body, gently move your fingers and toes, take a deep breath and as you exhale, sit up.

### Auto-suggestion

After practicing the sequence shown, visualize your body in your mind's eye, and repeat this simple formula mentally: "I relax the toes. I relax the toes. The toes are relaxed. I relax the calves. I relax the calves. The calves are relaxed." Continue on up the body, specifying the turn-out to each part along the way - the stomach, lungs, heart, jaw, scalp, brain, etc. Feel a wave of relaxation rising up your body as you guide your awareness through each part. Each time you inhale feel a wave of oxygen flowing down to your feet; each time you exhale, feel the tension flowing out of your body, leaving your mind like a deep, still lake, without a ripple. Now dive deep in to the centre of this lake. Deep within yourself, and experience your true nature.

**Face** Squeeze every muscle in your face up tight, bringing it to a point around the nose. Now open the face wide, stretching

your eyes open, and stick out your tongue as far as it will go. Relax.

**Hands and arms** Raise your right hand an inch off the floor. Make a fist, tense the arm, then let it drop. Repeat on the other side. Relax.

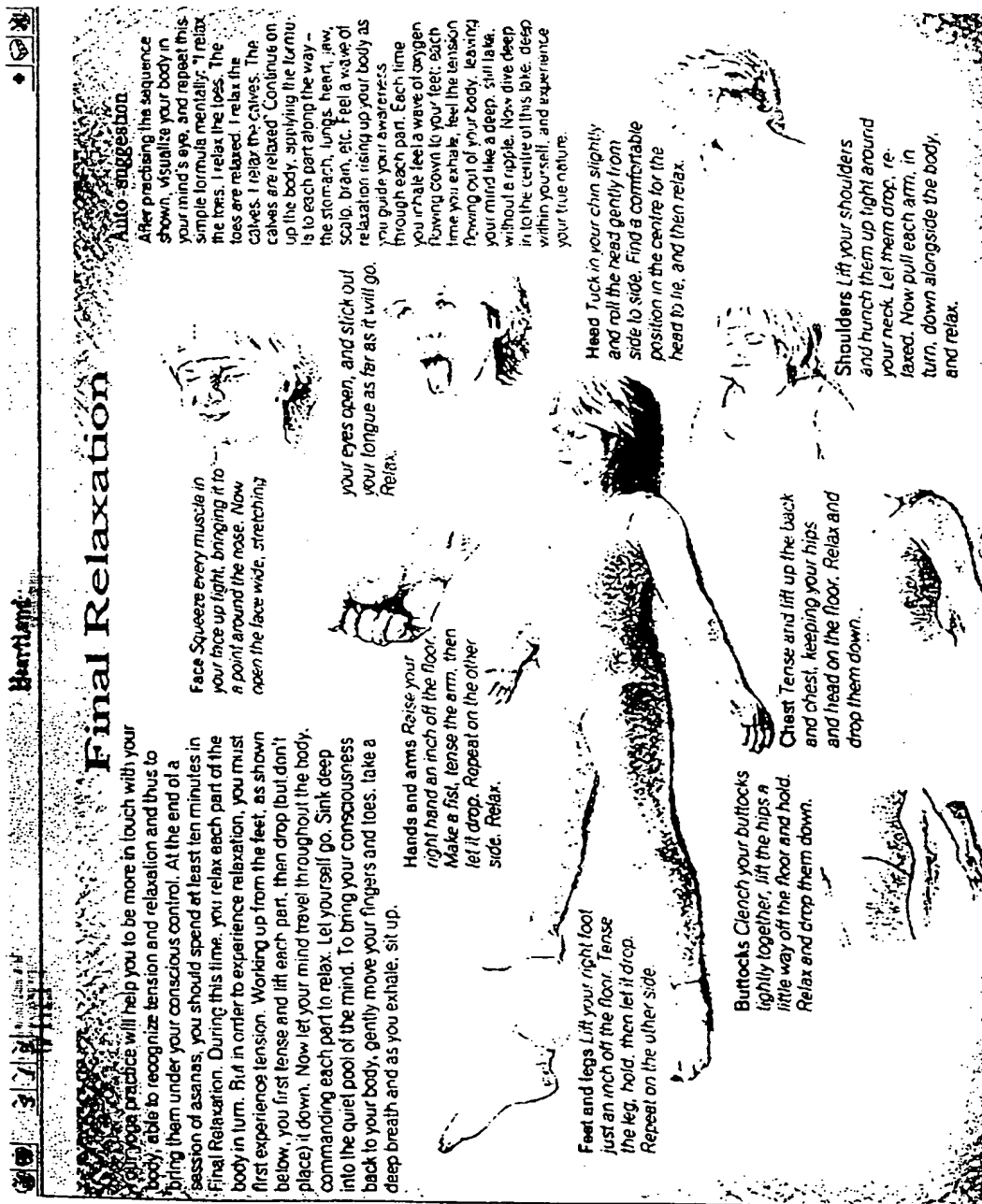
**Feet and legs** Lift your right foot just an inch off the floor. Tense the leg, hold, then let it drop. Repeat on the other side.

**Buttocks** Clench your buttocks tightly together, lift the hips a little way off the floor and hold. Relax and drop them down.

**Chest** Tense and lift up the back and chest, keeping your hips and head on the floor. Relax and drop them down.

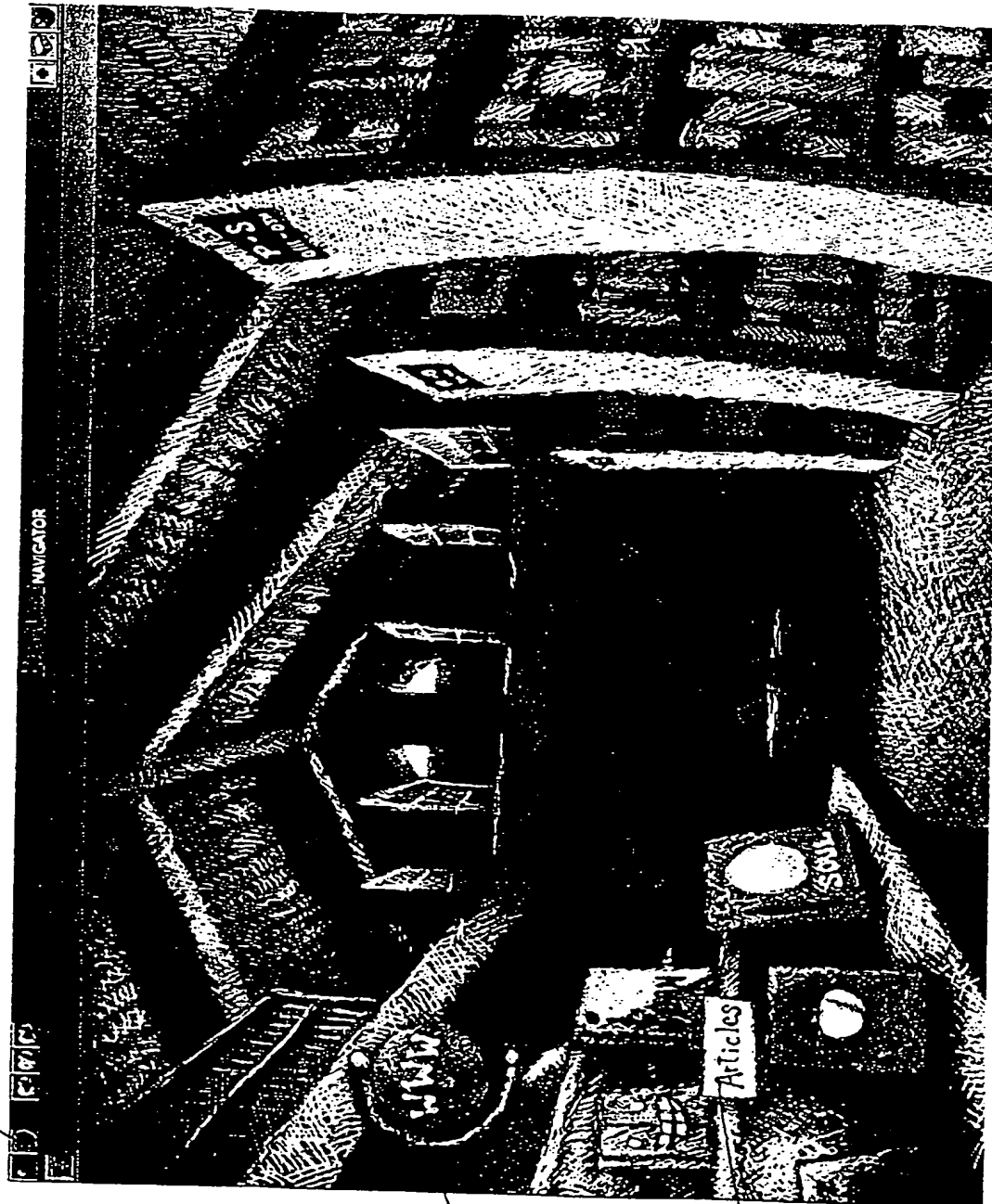
**Head** Tuck in your chin slightly and roll the head gently from side to side. Find a comfortable position in the centre for the head to lie, and then relax.

**Shoulders** Lift your shoulders and hunch them up tight around your neck. Let them drop, relaxed. Now pull each arm, in turn, down alongside the body, and relax.



HeartLand 32 Fig 32

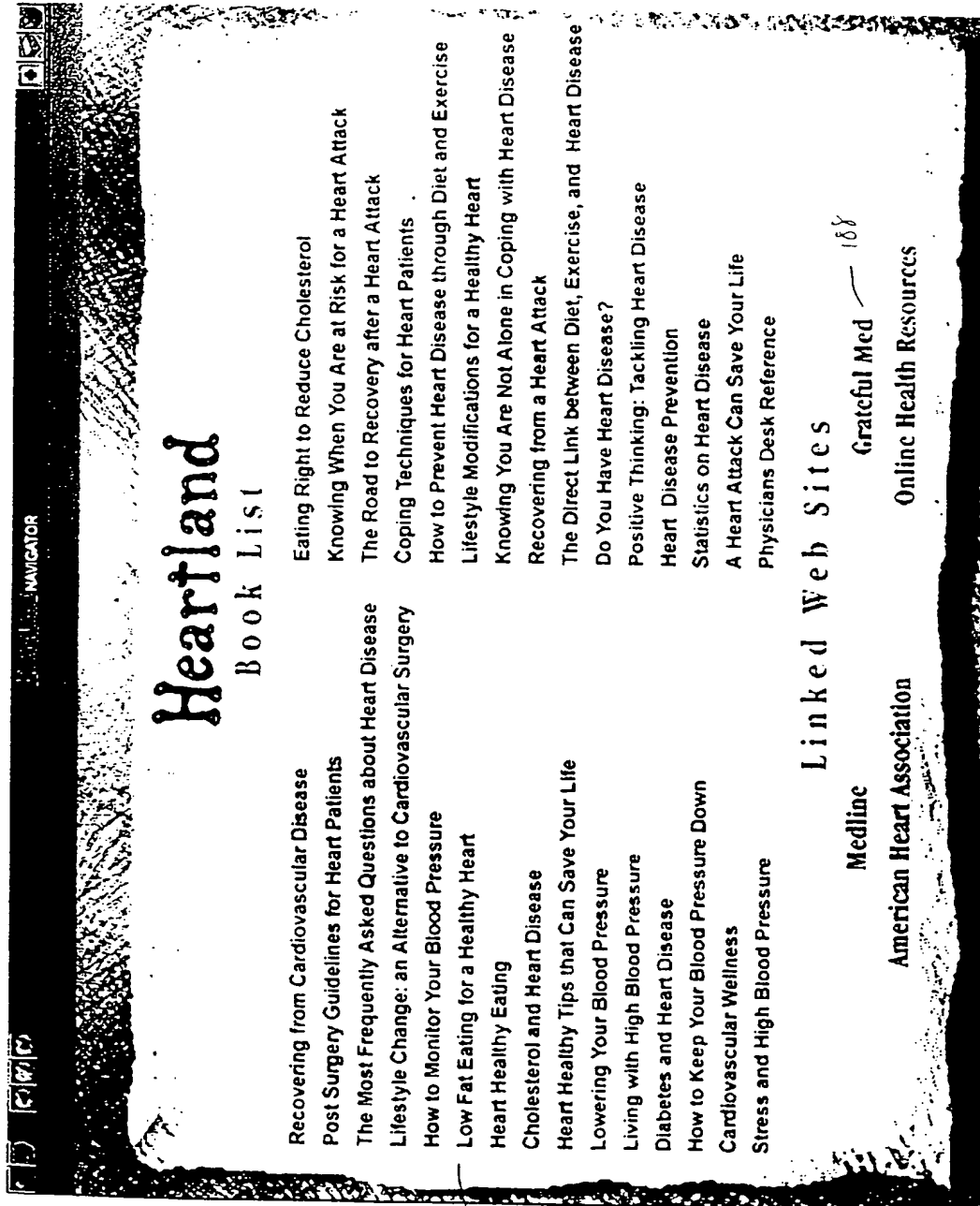
184



182

180

HeartLand 33 Fig 33



HeartLand 34 Fig 34

The screenshot displays the Medscape website with a top navigation bar containing icons for Home, Search, and other functions. Below the navigation bar, a banner for Medscape's free content is visible, including a link to 'Register Here' and 'Members Sign In'. The main content area features a 'Today's Question' section with a link to 'Which blood tests are indicated for assessment of the impotent patient? [Answer]'. A 'Medscape @' section highlights health professionals and interested consumers, featuring thousands of free full-text, peer-reviewed articles, medical news, MEDLINE, and interactive quizzes. An 'Announcements' section lists 'View Tuesday, September 14, 1999: Search TODAY! - Interactive Case Challenges - New Clinical Topics: Esophageal Cancer and Injury Case - Screening Mammography Survey'. A 'Topics' sidebar lists links for Patient Info, CME Center, News, Journals, Exam Room, Reference, and Partners. The main content area also includes a 'Newest Articles' section with the title 'Medical Moments - The Kindest Cut of All' and a link to 'Also: Diver Cut of His Depth, February Headlines, January Vital Signs, Monstrous Dissection'. Below this, a 'Medical Practice' section features a link to 'Understanding, Recognizing, and Treating Rett Syndrome' by Sarojini S. Budden, MD, Oregon Health Sciences University in Portland. A 'Women's Health' section includes a link to 'Also: Hepatitis & Smoking, PTSD & Infertility, Gun Case Challenge, Genetic Link'. Finally, a 'Primary' section features a link to 'Recognizing and Treating Depression in the Elderly' by Mark D. Miller, MD, University of Pittsburgh Medical Center.

Today's Question: Which blood tests are indicated for assessment of the impotent patient? [Answer]

Medscape @, for health professionals and interested consumers, features thousands of free full-text, peer-reviewed articles, medical news, MEDLINE, and interactive quizzes. Updated daily!

Announcements: View Tuesday, September 14, 1999: Search TODAY! - Interactive Case Challenges - New Clinical Topics: Esophageal Cancer and Injury Case - Screening Mammography Survey

Topics: Patient Info, CME Center, News, Journals, Exam Room, Reference, Partners

The Web's largest collection of freely-available, full-text, clinical articles. Continuing Medical Education (CME) is available on articles in each topic.

Newest Articles

Medical Moments - The Kindest Cut of All  
Also: Diver Cut of His Depth, February Headlines, January Vital Signs, Monstrous Dissection

Medical Practice  
Understanding, Recognizing, and Treating Rett Syndrome  
Sarojini S. Budden, MD, Oregon Health Sciences University in Portland  
Also: Hepatitis & Smoking, PTSD & Infertility, Gun Case Challenge, Genetic Link

Women's Health  
Recognizing and Treating Depression in the Elderly  
Mark D. Miller, MD, University of Pittsburgh Medical Center



HeartLand 35 Fig 35



# DETERMINING YOUR TARGET HEART RATE ZONE

1. Take your pulse on your neck or wrist.
2. Subtract your age from 220.
 

220	Sample Age
<u>-40</u>	
Maximum heart rate	180
3. Multiply maximum heart rate by .55
 

x .55
<u>99</u>
Lower heart rate limit
4. Multiply maximum heart rate by .85
 

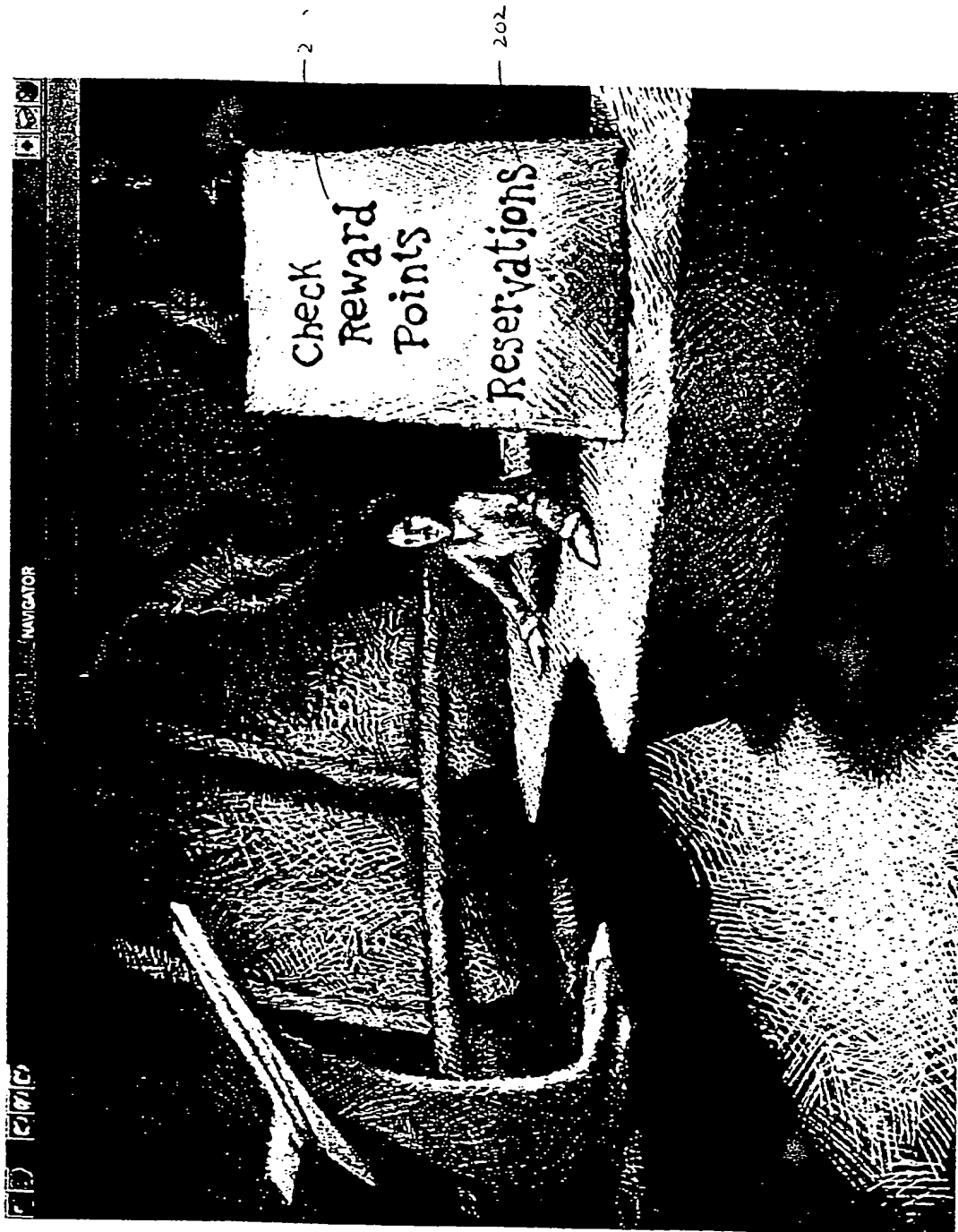
180
<u>x .85</u>
Upper heart rate limit
153
5. Your target heart rate zone is defined by lower and upper heart rate limits.

## TO SEE IF YOU ARE IN YOUR TARGET HEART RATE ZONE

Take your pulse for :10 seconds  
and multiply that number by six.

This should be in your  
Target Heart Rate Zone.

HeartLand 47 Fig 36



37/60

Fig 37

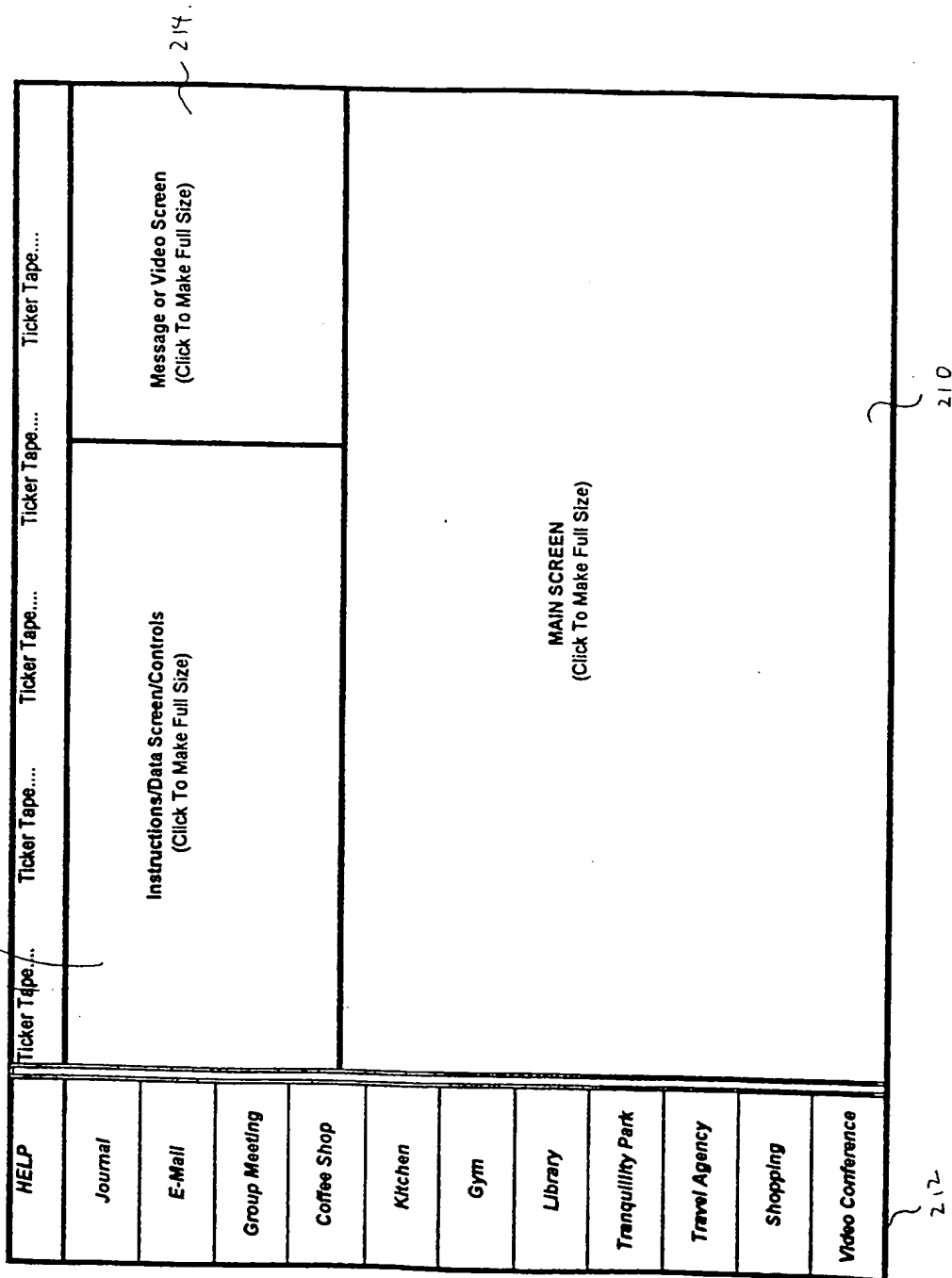
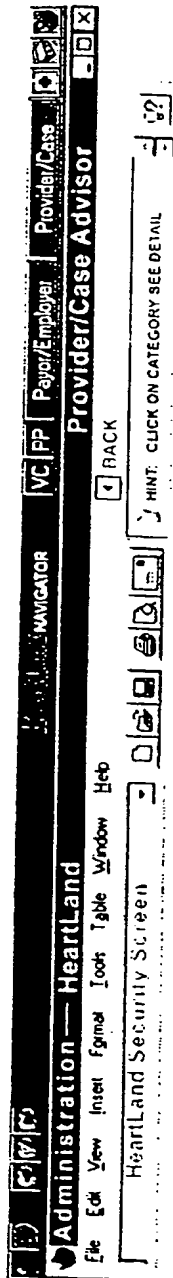


Fig 38

HeartLand 66



220

**Administration - HeartLand** ? X

Please enter your authentication information.

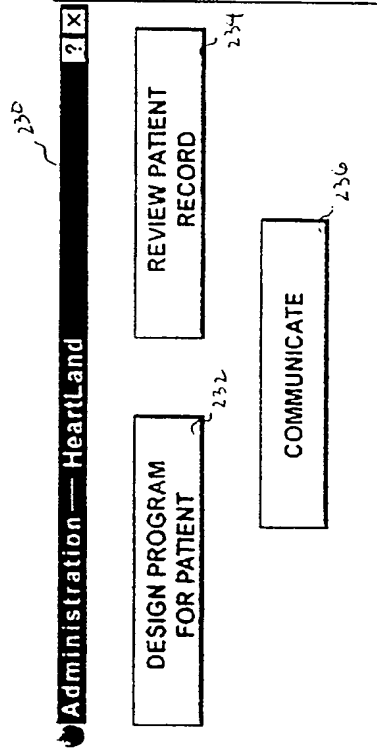
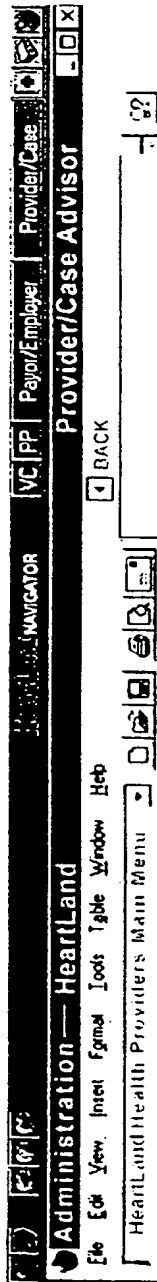
Resource: unspecified

User name: Schroeder ~ 222

Password: \*\*\*\*\* ~ 224

OK Cancel

HeartLand 79 Fig 39



40/60

HeartLand 72 Fig 40

**Administration - HeartLand**

File Edit View Intel Format Tools Table Window Help

Heartland Case Management Review

INDICATOR VC PP Payor/Employer Provider/Case

BACK MAIN MENU BEHAVIOR RECOMMEND

HINT: CLICK ON CATEGORY SEE DETAIL

276

Chosen case for review: Fred Smith Date: 3/10/98

Heartland I.D. #: 23-642 Social Security #: 213-48-3947

Subscriber since: 1/20/98 Total weeks on Heartland program: 246

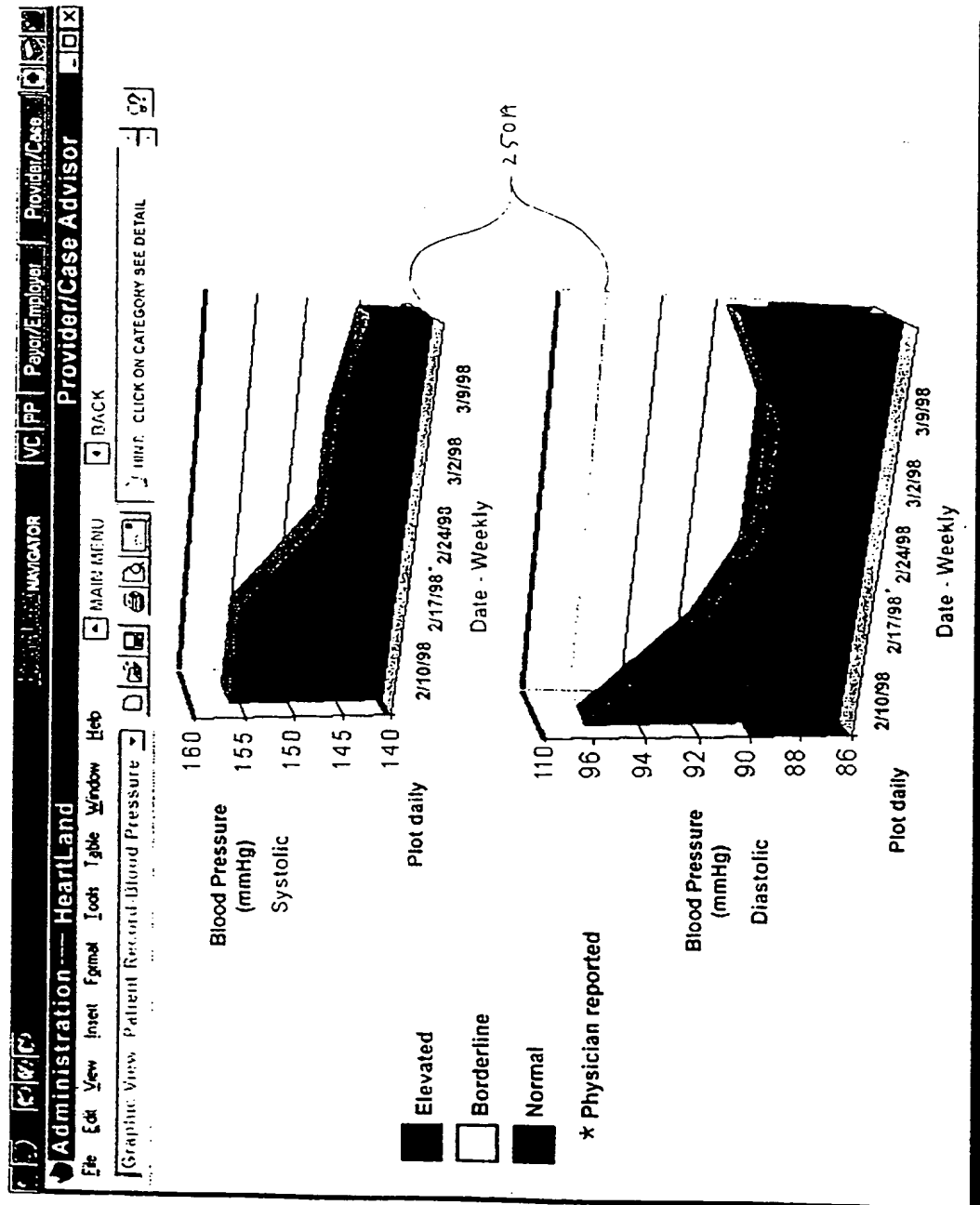
258 260 262 264 266 268 270 272

Fred Smith/48 years, anterior M.I./1/6/98 Risk Factors: Hypertension, smoker, lack of exercise, elevated LDL cholesterol

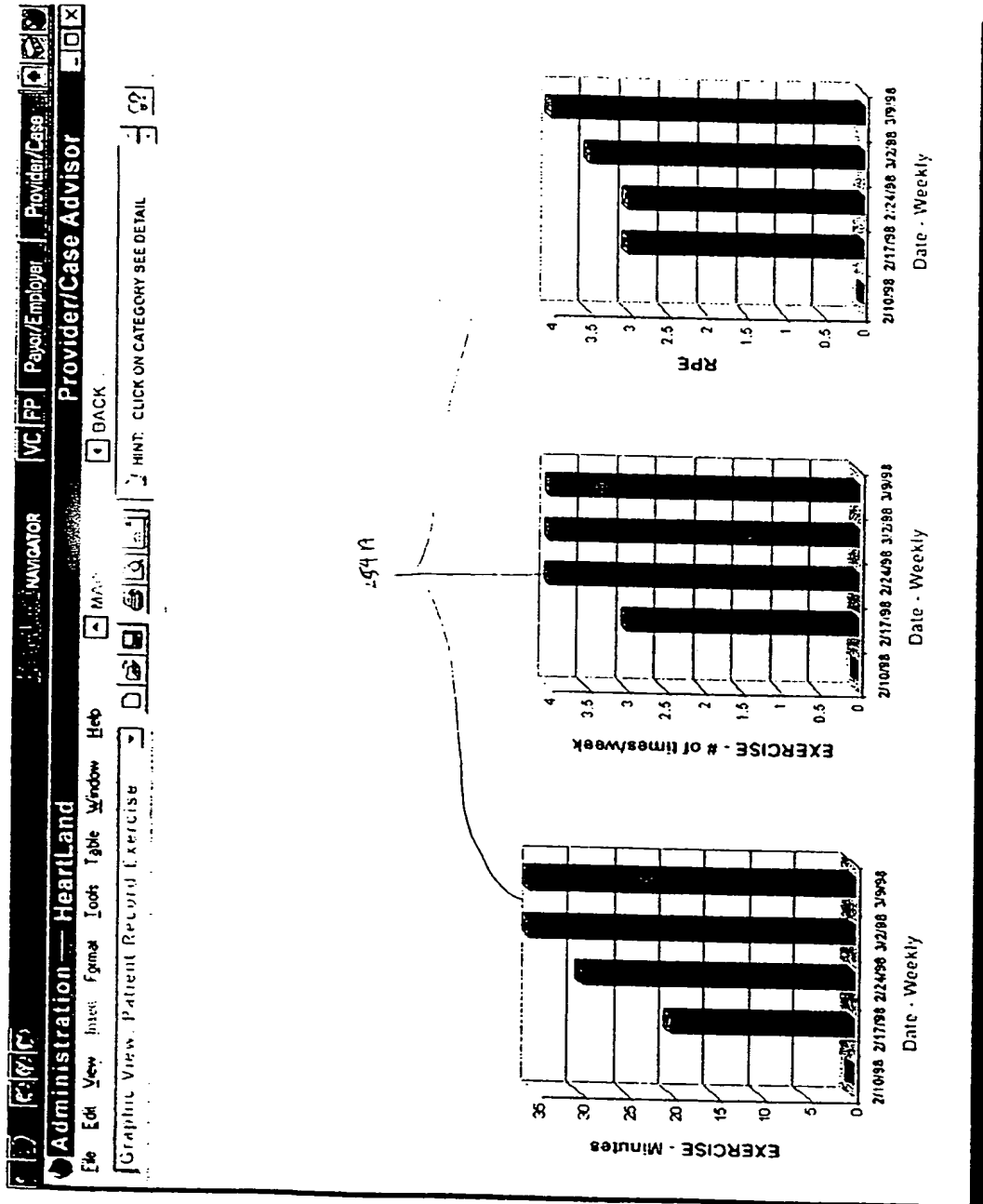
DATE	2/10/98	2/17/98	2/24/98	3/2/98	3/9/98	GOALS
BASELINE (1/20/98)						
B.P. (160/98 mmHG)	166/96	166/92	148/90	148/90	146/92	B.P. < 140/90 mmHG
Cigarettes/day (20)	16	10	0	0	0	Complete Smoking Cessation
Physical Activity minutes/x-week/RPE	0/0/0	20/3/3	30/4/3	35/4/3.5	35/4/4	45 mins walking / 7 days week / 6
Resting H.R. 88	79	68	69	67	67	
Weight baseline (180 lbs.)	179 lbs.	178 lbs.	176 lbs.	176 lbs.	172 lbs.	WEIGHT: 170 BMI: 25.00
Stress level (8)	7.0	7.2	6.9	6.1	6.9	3.5 (10=MAX)
Aspirin 325 mg/day (missed dose/wk)	1	2	1	1	1	Compliant use of Medications
Hydrochlorothiazide 12.5 mg. daily (missed dose/wk)	1	1	0	0	0	
Lovastatin 20 mg/day (missed dose/wk)	1	1	0	0	0	
Calories avg / day	3,600		3,300		3,100	2,800 cal / day
Fat Calories %	45%		45%		20%	15% fat calories
Cholesterol - LDL	142 mg/dl		140 mg/dl		125 mg/dl	100 mg/dl
Cholesterol - HDL	36 mg/dl		37 mg/dl		39 mg/dl	45 mg/dl
Cholesterol	246		225		210	190

41/60

HeartLand 75 Fig 41



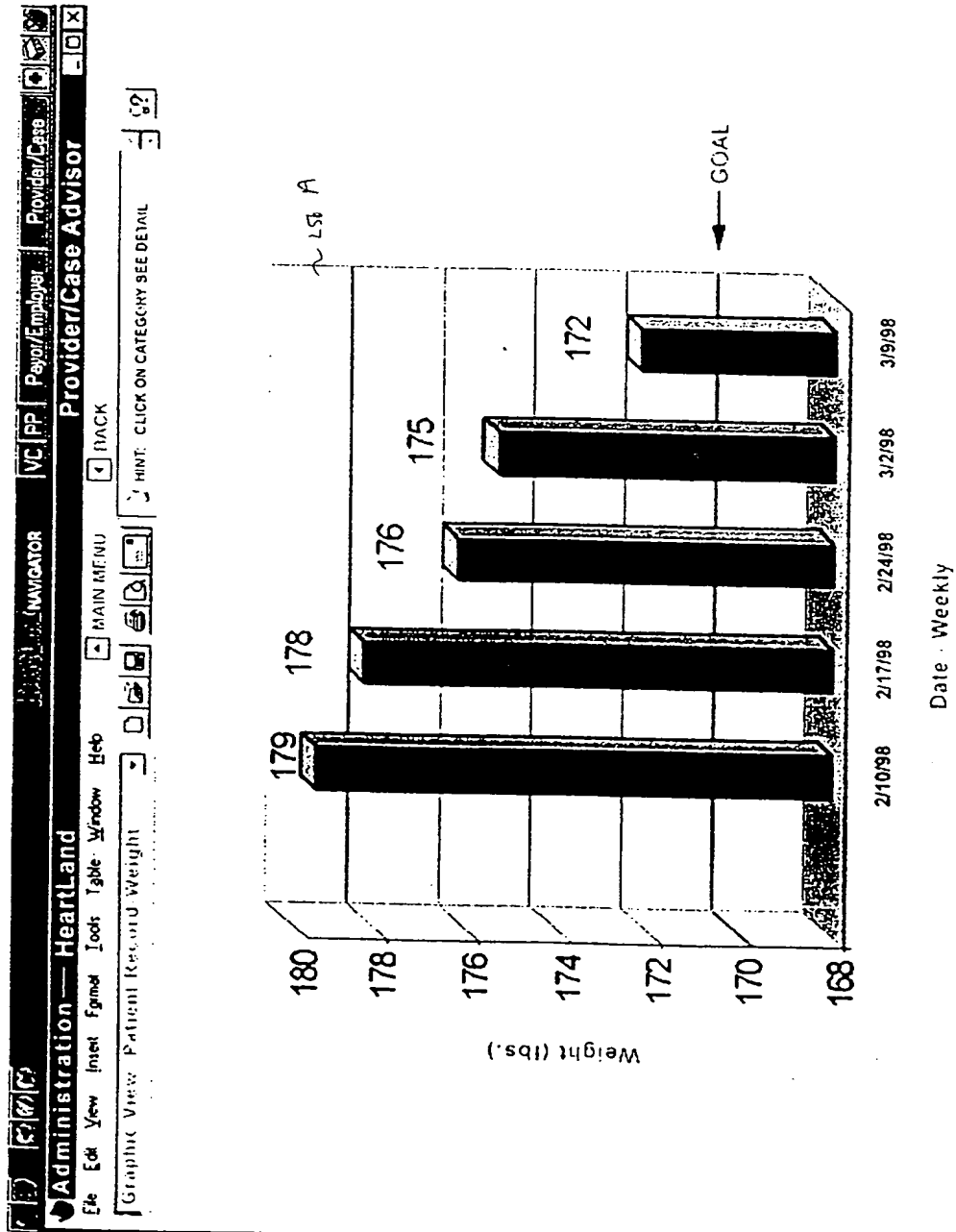
Heartland 78 Fig 42



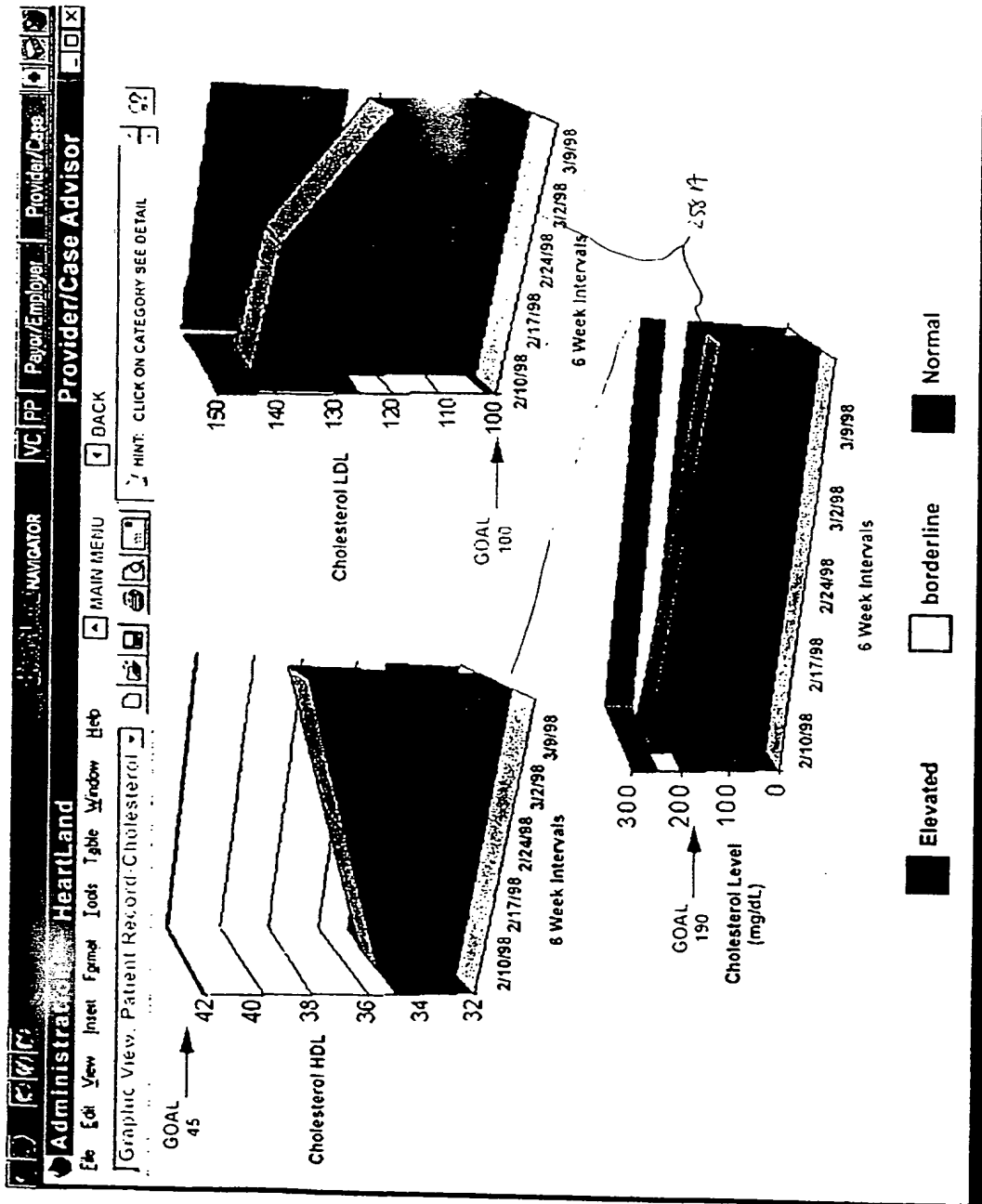


43/60

Heartland 76 Fig 43



HeartLand 77 Fig 44



45/60

HeartLand 73 Fig 45

Administration — HeartLand

File Edit View Insert Format Tools Table Window Help

HeartLand Behavioral Change Assessment

VC PP Payor/Employer Provider/Case

NAVIGATOR MAIN MENU BACK

HINT: CLICK ON CATEGORY SEE DETAIL

BEHAVIORAL CHANGE ASSESSMENT / Fred Smith			
Behavioral Intention	2	3	4
Self Efficacy	3	3	4
Social Support	2	3	4
TOTAL	7	9	12



**NOTE: Change Assessment Scored as follows:**

<u>Behavioral Intention</u>	1 No intention to change 2 Considering change 3 Committed to change 4 Strongly committed to change
<u>Self-Efficacy</u>	1 No confidence in ability to change 2 Little confidence in ability to change 3 Confidence in ability to change 4 Certain of ability to change
<u>Social Support</u>	1 Co-workers, friends and family sabotage efforts to change 2 Co-workers, friends and family are apathetic to change 3 Co-workers, friends and family are helpful and co-operative 4 Co-workers, friends and family are willing to change also

HeartLand '94 118 46

Administration — HeartLand

File Edit View Insert Format Tools Table Window Help

NAVIGATOR VC | PP | Payor/Employer Provider/Case

Provider/Case Advisor

MAIN MENU BACK

HINT: CLICK ON CATEGORY SEE DETAIL

## HeartLand Recommendations

HEARTLAND PATIENT: Fred Smith PATIENT NUMBER: 23-642

DATE: 3/10/98

INCREASE EXERCISE TO: 45 minutes

INCREASE RPE TO: Level 5

see the Village Gym for suggestions and preferences

INDICATE TO PHYSICIAN BLOOD PRESSURE IN YELLOW ZONE AT: 146/92

CHOOSE REWARD FROM: Village Mall

For 60 Smoke Free Days

Good support group attendance

OTHER: Diet Exercise Stress Support

TOTAL AVERAGE DAILY CALORIES: 3,100

TOTAL DAILY CALORIES FROM FAT: 465 (15%)

FREQUENCY AND DURATION OF STRESS REDUCTION EXERCISES: 45 minutes per sessions at least 5x/ week

ATTEND GROUP SUPPORT SESSIONS: 4 times/week

CASE ADVISORY REVIEW: 4x/mo. 2x/mo. 1x/mo.

NEXT PHYSICIAN VISIT DUE: 5/25/97

Accepting Editing Communications

- Remain cigarette free!
- Remember to use your seatbelt!
- Remember back and flexibility exercises!

47/60

HeartLand 80 FIG 47

HeartLand 80

Administration — HeartLand

File Edit View Insert Format Tools Table Window Help

VC | FP | Paper/Employee | Provider/Case

Provider/Case Advisor

MAIN MENU BACK

Heartland Case Advisory System

HINT: CLICK ON CATEGORY SEE DETAIL

## HeartLand and Communications Center

### Send Messages to...

☒ Subscriber ☒ Auto File

☐ Responsible Physician

☐ Other

### Select Type of Message

☒ Audio E-Mail CC: ☒ Resp. Physician

☐ Text E-Mail ☐ Subscriber

☐ FAX ☐ Other

BCC: ☐ Other

### Type Text Message here:

### Record Message here:

▶ ◀ ◂ ◃ ▹ ▸ ▹ ▸

SEND MESSAGE

### Heartland Recommendations for:

Fred Smith

Date: 3/10/98

1. INCREASE EXERCISE TO: 45 minutes

2. INCREASE RPE TO: Level 5

see the Village Gym for suggestions and preferences

3. INDICATE TO PHYSICIAN BLOOD PRESSURE IN YELLOW ZONE AT: 146/92

4. CHOOSE REWARD FROM: Village Mall  
For 30 Smoke Free Days

5. Good support group attendance

6: OTHER: ▶

Diet  
Exercise  
Stress  
Support

Best Wishes,  
Susan , your case advisor

Heartland 49 Fig 48



Heartland 5.1

Administration — HeartLand

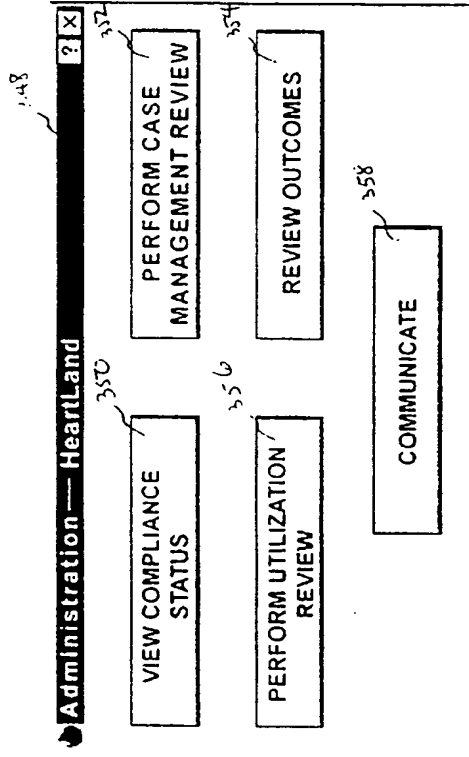
File Edit View Insert Format Tools Table Window Help

HeartLand and Payroll Employer Main Menu

NAVIGATOR VC PP Payor/Employer Provider/Case

HealthPlan Payor/Employer

BACK



50/60

HeartLand 52 Fig 50

HeartLand Compliance Status

Administration — HeartLand

File Edit View Insert Format Tools Table Window Help

NAVIGATOR VC PP Payor/Employer Provider/Case

HealthPlan Payor/Employer

MAIN MENU BACK VIEW COMPARATIVE CHARTS

HINT: CLICK ON CATEGORY SEE DETAIL

Report Date: July 31, 1998

Time Period: Last 12 months

Category	Description	Total Eligible	Participating		Compliant		Probation		Terminated	
			No. eligible	Pct. eligible	No.	Pct.	No.	Pct.	No.	Pct.
Category I	Current-Year MI Survivors	1,009	105	10.4%	87	82.9%	13	12.4%	5	4.8%
Category II	Current-Year Bypass & Angioplasty	733	76	10.4%	59	77.6%	10	13.2%	7	9.2%
Category III	Current-Year Diagnosed CAD, Surgery Rec	740	71	9.6%	63	88.7%	5	7.0%	3	4.2%
Category IV	All Diagnosed Angina	6,726	708	10.5%	553	78.1%	84	11.9%	71	10.0%
Category V	Prior-Years' MI & Post-Surgical - High Risk	2,183	680	31.1%	585	86.0%	38	5.6%	57	8.4%
Category VI	Prior-Years' MI & Post-Surgical - Low Risk	6,547	227	3.5%	187	82.4%	22	9.7%	18	7.9%
Category VII	(2 or more factors)	75,826	3,191	4.2%	2,765	86.6%	148	4.6%	278	8.7%
Category VIII	Wellness Program	125,714	7,920	6.3%	6,267	79.1%	1,359	17.2%	294	3.7%
Grand Totals & Percent Averages			12,978		10,566	81.4%	1,879	12.9%	733	5.6%



51/60

HeartLand 53 Fig 51

HeartLand Comparative Cost Review

Administration — Heartland HealthPlan Payor/Employer

File Edit View Insert Format Tools Table Window Help

VC PP Payor/Employer Provider/Care

MAIN MENU BACK

HINT: CLICK ON CATEGORY SEE DETAIL

Report Date: July 31, 1998

Time Period: Last 12 months

Category	Description	Number on Program	Heartland Group Medical Costs	Heartland Program Costs	HEARTLAND COSTS	Control Group Medical Costs	Heartland Savings
Category I	Current-Year MI Survivors	105	253,385	181,860	435,015	589,221	154,208
Category II	Current-Year Bypass & Angioplasty	78	140,678	122,360	263,036	327,163	64,117
Category III	Current-Year Diagnosed CAD, Surgery Rec	77	240,702	133,210	373,912	559,772	185,860
Category IV	All Diagnosed Angina	708	1,139,172	1,047,840	2,187,012	2,649,237	462,225
Category V	Prior-Years MI & Post-Surgical - High Risk	680	1,640,840	1,006,400	2,647,240	3,815,907	1,188,667
Category VI	Prior-Years MI & Post-Surgical - Low Risk	227	420,177	197,490	617,667	977,158	359,489
Category VII	(2 or more factors)	3,191	2,003,948	717,975	2,721,923	4,680,344	1,938,421
Category VIII	Wellness Program	7,920	2,304,720	.	2,304,720	5,359,814	3,055,094
TOTALS		12,984	8,143,600	3,406,925	11,550,525	18,938,605	7,388,080

HeartLand 55  
Fig 52

HeartLand Case Review

File Edit View Insert Format Tools Table Window Help

Administration — HeartLand

VC | PP | Payor/Employer | Provider/Case

HealthPlan Payor/Employer

MAIN MENU

RACK

HINT: CLICK ON CATEGORY SEE DETAIL

390

Administration — HeartLand

The patient you have chosen for review

☒ HAS

☐ HAS NOT

signed a limited waiver of confidentiality.

The following information reflects this choice.

CONTINUE... 392

53/60

HeartLand 56 Fig 53 400

HeartLand Case Management Review

Administration — HeartLand

File Edit View Insert Format Tools Table Window Help

NAVIGATOR

VC PP Payer/Employer Provider/Case

HealthPlan Payor/Employer

BACK REVIEW COSTS REVIEW MEDICAL ACTIVITY

HINT: CLICK ON CATEGORY SEE DETAIL



Chosen case for review: Fred Smith

Date: 3/10/98

Heartland I.D. #: 23-642

Social Security #: 213-48-3947

Subscriber since: 1/20/98

Total weeks on Heartland program: 1

Fred Smith: 48 years, anterior M.I. 1/6/98 Risk Factors: Hypertension, smoker, lack of exercise, elevated LDL cholesterol

DATE	2/10/98	2/17/98	2/24/98	3/2/98	3/9/98	GOALS
DATE	2/10/98	2/17/98	2/24/98	3/2/98	3/9/98	
B.P. (160/98 mmHG)	160/96	166/92	140/90	148/90	146/92	B.P. < 140/90 mmHG
Cigarettes/day (20)	16	10	0	0	0	Complete Smoking Cessation
Physical Activity minutes/week/RPE	0/0/0	20/3/3	30/4/3	35/4/3.5	35/4/4	45 mins walking 1/7 days week 1/6
Resting H.R. 68	79	68	69	67	67	
Weight baseline (180 lbs.)	179 lbs.	178 lbs.	176 lbs.	176 lbs.	172 lbs.	WEIGHT: 170 BMI: 25.00
Stress level (8)	7.0	7.2	6.9	6.1	6.9	3.5 (10=MAX)
Aspirin 325 mg/day (missed dose/wk)	1	2	1	1	1	
Hydrochlorothiazide 12.5 mg. daily (missed dose/wk)	1	1	0	0	0	Compliant use of Medications
Lovastatin 20 mg/day (missed dose/wk)	1	1	0	0	0	
Calories avg/day	3,800		3,300		3,100	2,800 cal/day
Fat Calories %	45%		45%		20%	15% fat calories
Cholesterol - LDL	142 mg/dl		140 mg/dl		125 mg/dl	100 mg/dl
Cholesterol - HDL	36 mg/dl		37 mg/dl		39 mg/dl	45 mg/dl
Cholesterol	246		223		210	190

404

406

408

410

Fig 54

HeartLand 60

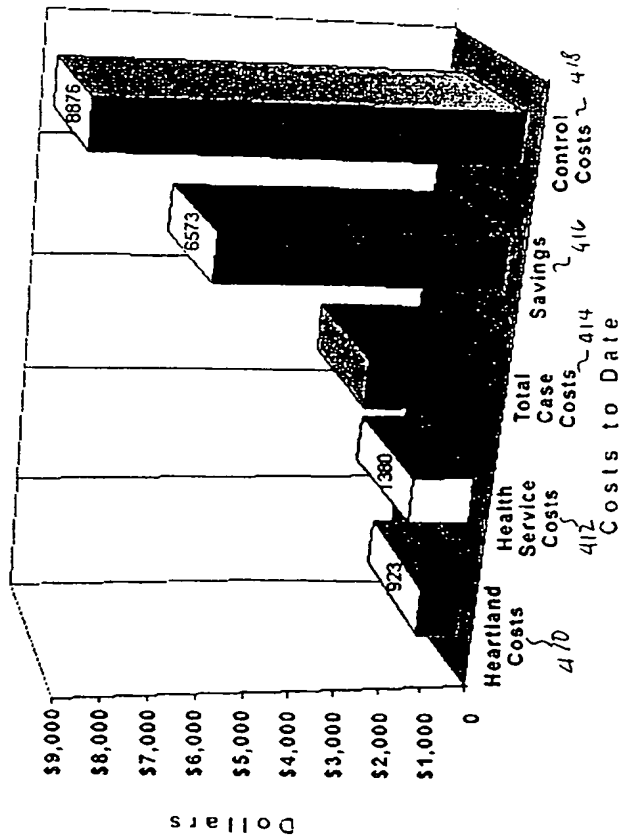
HeartLand Case Management Review

HINT: CLICK ON CATEGORY SEE DETAIL

Chosen case for review:  Date:   
 HeartLand I.D. #:  Social Security #:

CASE vs. NORM

Case Number	23-642
Last Updated	2/27/98
Weeks on HeartLand	4

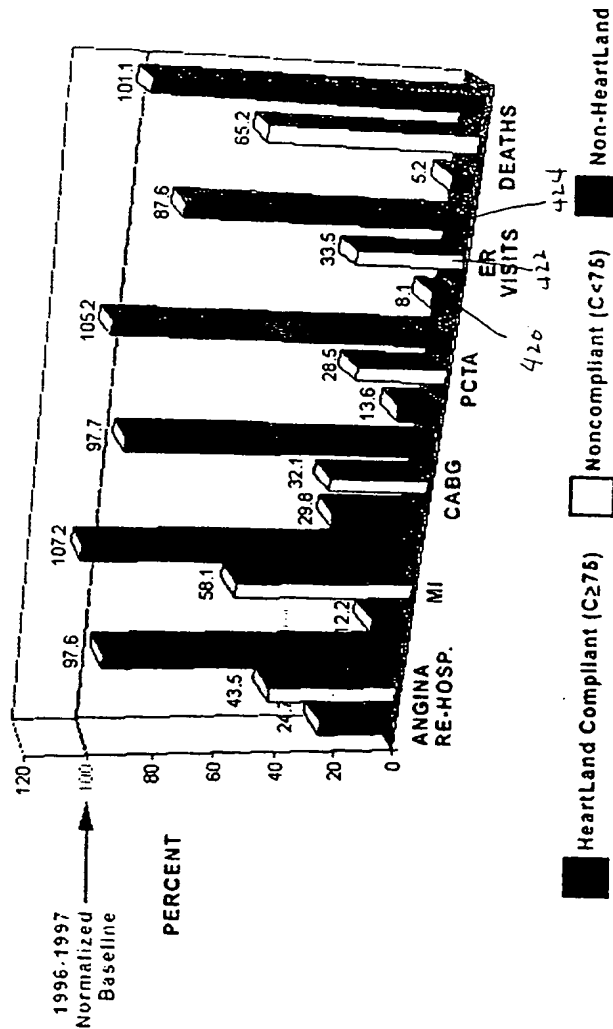


HeartLand 62 Fig 55

Administration — HeartLand  
 File Edit View Insert Format Tools Window Help  
 HeartLand Outcomes Report  
 NAVIGATOR VC PP Payor/Employer Provider/Case  
 HealthPlan Payor/Employer  
 MAIN MENU BACK  
 HINT: CLICK ON CATEGORY SEE DETAIL

# One Year HeartLand Outcomes Report

Report Date: 3/25/99



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HeartLand 65 Fig 56

HeartLand 65

File Edit View Insert Format Tools Table Window Help

HeartLand Utilization Review

NAVIGATOR VC PP Payor/Employer Provider/Case

HealthPlan Payor/Employer

BACK REVIEW MORE GROUPS/ACHILLS

HINT: CLICK ON CATEGORY SEE DETAIL

### Utilization Review

Target : 23%

Group or Facility	ID No.	Specialty	YTD CAD Cases	Percent referred to Heartland	Percent Heartland vs. norm
Central Valley IPA	8224	Primary	28	22.90%	-0.10%
Baywatch Phys & Sur	9732	Cardio	127	16.70%	-6.30%
Fulton Cty. Cardiolog.	5376	Cardio	89	24.50%	1.50%
Care Fndn of Clovis	8479	Primary	52	23.50%	0.50%
Riverside Primary Care	6745	Primary	77	18.80%	-4.20%

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HeartLand 64 Fig 57

Administration — HeartLand

Edit View Input Format Tools Table Window Help

HeartLand Utilization Review

NAVIGATOR

VC PP Payor/Employer Provider/Case

HealthPlan Payor/Employer

BACK REVIEW MORE PHYSICIANS

MAIN MENU

HINT: CLICK ON CATEGORY SEE DETAIL

## Perform Healthplan Utilization Review

Physician	ID No.	Specialty	YTD CAD Cases	YTD norm is 17.3%	
				Percent Heartland	Percent Heartland vs. norm
Moeller, J	66537	Cardio	30	15.6%	-2.2%
King, S	29873	Cardio	38	32.6%	+1.4%
Carvell, C	89721	Primary	16	12.0%	-4.3%
Richards, B	52983	Primary	42	18.7%	+1.4%

HeartLand 63 Fig 58

HeartLand 63

Administration --- HeartLand

File Edit View Internet Format Tools Table Window Help

HeartLand Case Advisory System

VC PP Payor/Employer Provider/Case

HealthPlan Payor/Employer

MAIN MENU BACK

HINT: CLICK ON CATEGORY SEE DETAIL

## HeartLand Communications Center

### Send Messages to...

450 ~ ☒ Heartland ☐ Subscriber ~ 454

☒ Responsible Physician ~ 452

☐ Other

### Select Type of Message

☐ Audio E-Mail ~ 456

☐ Text E-Mail ~ 458

☐ FAX ~ 460

### Type Text Message here:

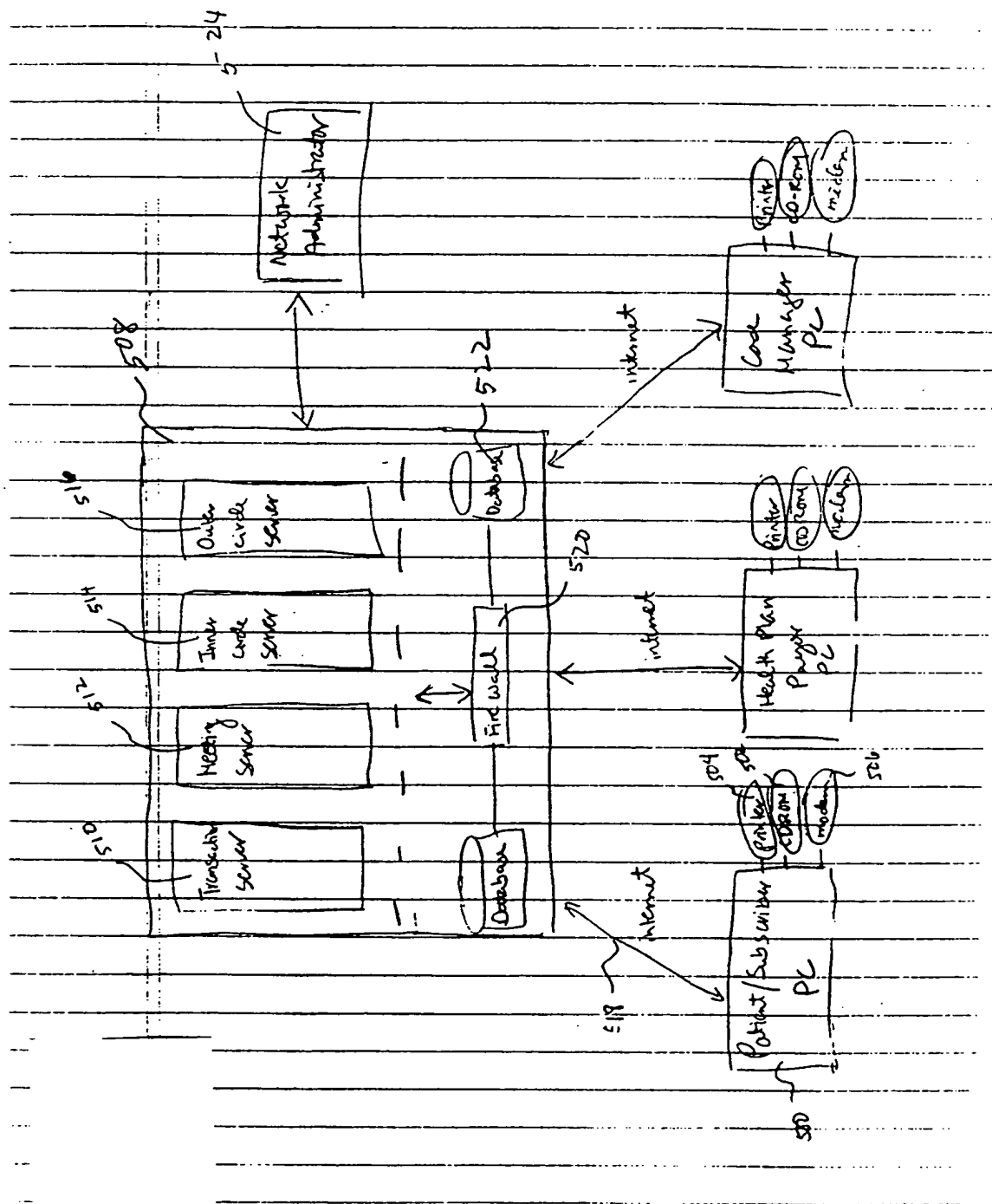
### Record Message here:

Record Message here:

SEND MESSAGE

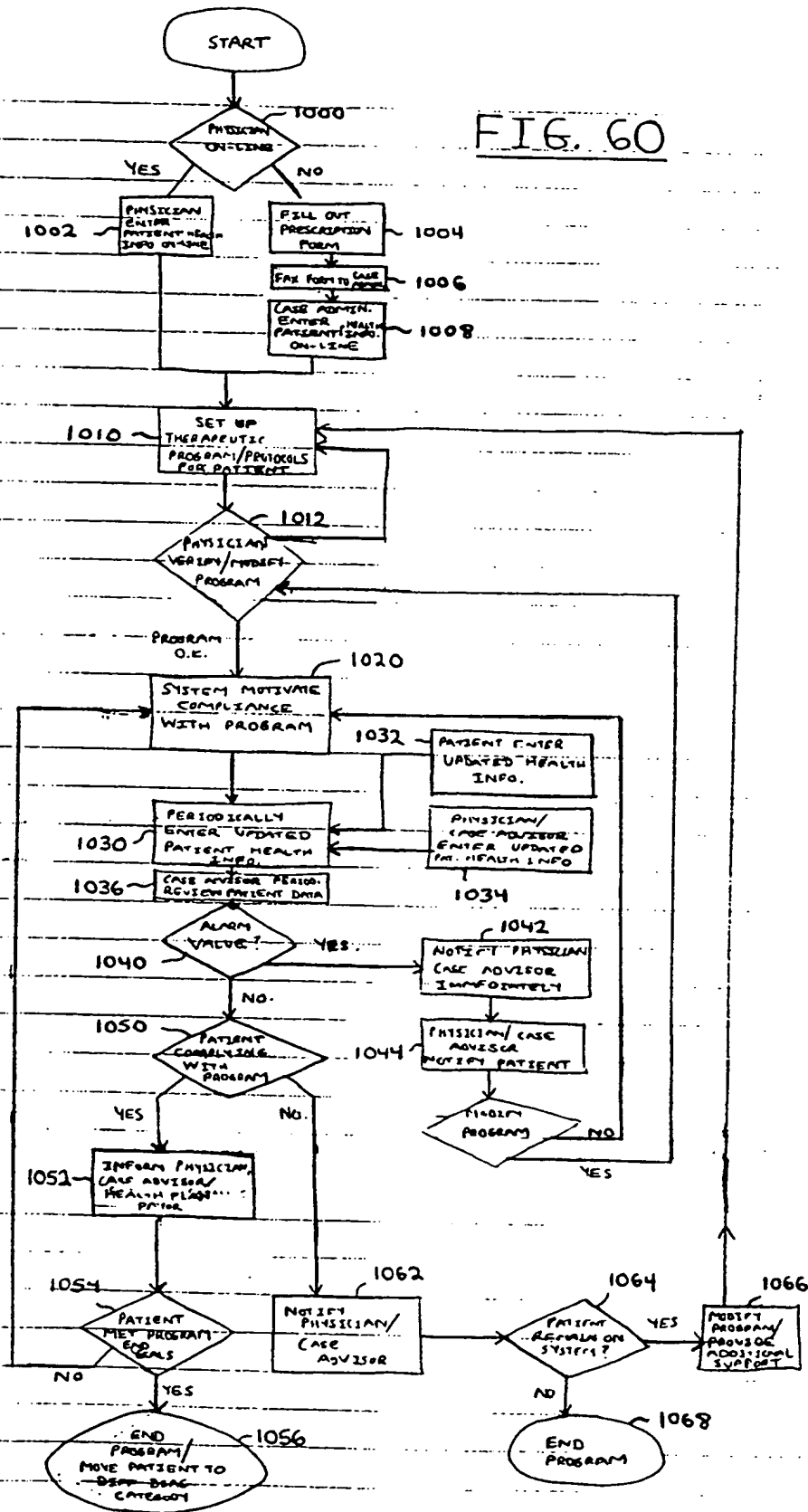


Fig 59



60/60

FIG. 60



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US98/14147

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G06F 15/00

US CL : 128/920; 600/300

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 128/897, 898, 920, 921, 923; 600/300, 301; 704/251, 501, 504; 705/2-4

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 5,673,691 A (ABRAMS et al) 07 October 1997, col. 3 line 34 to col. 6 line 56.	1, 3
A	US 5,612,869 A (LETZT et al) 18 March 1997, entire document.	1-35
A	US 5,301,105 A (CUMMINGS, JR.) 05 April 1994, entire document.	1-35
A	US 5,377,258 A (BRO) 27 December 1994, entire document.	1-35



Further documents are listed in the continuation of Box C.



See patent family annex.

Special categories of cited documents:		*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A	document defining the general state of the art which is not considered to be of particular relevance		
*E	earlier document published on or after the international filing date	*X	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*L	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Y	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*O	document referring to an oral disclosure, use, exhibition or other means		
*P	document published prior to the international filing date but later than the priority date claimed	*A	document member of the same patent family

Date of the actual completion of the international search

11 SEPTEMBER 1998

Date of mailing of the international search report

15 OCT 1998

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08/962,238	31 October 1997 (31.10.97)	US

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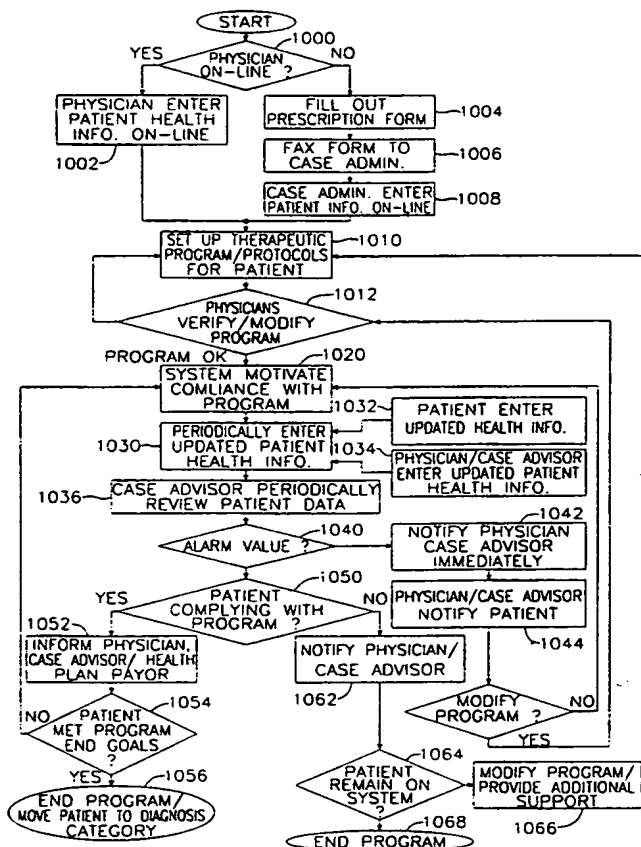
Published

With international search report.

(54) Title: THERAPEUTIC BEHAVIOR MODIFICATION PROGRAM, COMPLIANCE MONITORING AND FEEDBACK SYSTEM

## (57) Abstract

A therapeutic behavior modification program, compliance monitoring and feedback system includes a server based relational database, and one or more microprocessors electronically coupled to the server. The system enables development of a therapeutic behavior modification program having a series of milestones for an individual to achieve lifestyle changes necessary to maintain his or her health of recovering from ailments of medical procedures. The program may be modified (1012) by a physician or trained case advisor prior to implementation. The system monitors the individual's compliance (1050) with the program by prompting the individual to enter health-related data (1030), correlating the individual's entered data with the milestones in the behavior modification program, and generating compliance data indicative of the individual's progress toward achievement of the program milestones. The entire system is designed around a community of support motif including a graphical electronic navigator operable by the individual to control the microprocessor for accessing different parts of the system.



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**THERAPEUTIC BEHAVIOR MODIFICATION PROGRAM,  
COMPLIANCE MONITORING AND FEEDBACK SYSTEM**

**FIELD OF THE INVENTION**

The present invention relates generally to a computer-implemented system for promoting wellness and improving health, and more particularly to a therapeutic behavior modification program, compliance monitoring and feedback system.

**BACKGROUND OF THE INVENTION**

One of the most difficult and costly areas of health care, education, and rehabilitation involves the need for individuals to modify their behavior to prevent or recover from medical ailments. Heart disease, stroke, diabetes, asthma, chronic pain, depression, addiction, cancer and a wide variety of other ailments have been clinically shown to respond well to lifestyle modification, including changes to diet, exercise patterns, and stress levels. Patients who are recovering from a surgical procedure such as heart bypass surgery or are suffering from diabetes, for example, must often make lifestyle changes in order to survive.

When individuals are successful in making and adhering to positive lifestyle changes, they frequently require fewer physician visits, go to the hospital less often, and have fewer surgeries. Long term medical costs go down accordingly.

At present, many programs for helping patients make lifestyle changes involve a doctor's visit and distribution of a brochure describing the health benefits of behavior modification and lifestyle change. This method is often ineffective in modifying behavior because there is little or nothing in the way of an on-going support mechanism to assist the patient in complying with recommendations, insufficient means for motivating the patient to make recommended changes, and insufficient means for monitoring compliance with such recommendations. Participation in an on-going support program is often effective for patients who have undergone surgery and must make subsequent lifestyle changes, but currently available in-person programs involve costly medical staff and facilities. It can also be inconvenient for the patient to travel to such programs on a regular basis. Because of their cost and the potential for inconvenience, many support programs last for only a limited time, which is often insufficient for the patient to modify behavior thoroughly and effectively.

1 Another disadvantage of existing lifestyle modification programs is the lack of  
information readily available to the physician regarding the patient's compliance with the  
program. With the present push toward low cost yet high quality health care, a system by which  
a physician could readily access information on patient compliance has clear benefits.

5 The development of a therapeutic program that could effectively motivate patients to  
modify their behavior and change their lifestyles to prevent or recover from ailments, and could  
be delivered to them electronically at home, work, or while traveling, would be highly desirable.  
It would also be desirable for such a system to enable physicians and their staffs to receive  
frequent feedback regarding patients' compliance with their programs. It would be further  
10 desirable if such a system allowed for aggregate reviews of such information by health plan  
payors, such as HMOs, insurance companies, and large self-insured employers, for the purpose  
of enhancing the efficiency of managed health care.

## SUMMARY OF THE INVENTION

15 The present invention therefore provides for an integrated, computer-implemented,  
electronically deliverable patient therapeutic behavior modification program, compliance,  
monitoring, and feedback system which supports the design of customized therapeutic behavior  
and lifestyle modification programs for subscribers; accepts the input of current health data for  
20 these patients; enables the review of these health records by a physician; enables the performance  
of aggregate reviews of such records by health plan payors, such as HMOs, insurance companies,  
and large self-insured employers; and motivates the patient to comply with the program and  
make the necessary lifestyle changes through an integrated system of interactive graphical  
interfaces.

25 In an exemplary scenario, a physician prescribes parameters and goals for a such a  
therapeutic behavior modification program to help a patient recover from an ailment or surgical  
procedure, and these are input into the computer-implemented system. Alternately, one of  
several established behavior modification programs that have been designed for patient recovery  
from particular ailments or procedures can be utilized. The system provides a novel interface  
30 that allows immediate patient access to the behavior modification program and helps monitor  
compliance with the program by prompting the patient to input data relating to his or her  
adherence to the program's parameters. These parameters may relate, for example, to diet,  
exercise, and other factors pertinent to the behavior modification program. The patient,  
physician, case manager or members of the physician's staff may also input information relating  
35 to blood pressure, medication, and the results of other medical tests on a computer linked to the  
system. Using this input, the system can recommend a plan (also referred to as a therapeutic  
program) and goals based on established medical protocols. The physician can modify the  
program to customize it for the patient. Once the patient has begun to follow the program, the

1 system recommends modifications and updates to both physician and patient by correlating the patient's progress with previously established goals.

5 The system provides ongoing multimedia (audio, video, and e-mail) feedback to the patient through a novel, user-friendly interface designed around an interactive "village" or "community of support" motif that allows him or her to navigate electronically through different parts of the system. The interface provides access to pertinent medical information, an on-line journal that enables the patient to write down his or her feelings on a regular basis, an electronic calendar which integrates events mandated by the program with the patient's daily schedule, on-line interactive group support sessions with patients on similar programs, and motivational  
10 multimedia presentations. The system can make specific diet and exercise suggestions based on the patient's overall program. This data is monitored by a professional case advisor--a nurse trained in the protocols of the system's software--as well as electronically by the system's protocols themselves. The system provides specific feedback to the physician so that he or she can modify or update the program as the patient progresses; and in the aggregate to the health  
15 plan payor to assess management and cost factors. The health plan payor can also view individual records which are obtainable after receiving the proper medical release from the patient. By providing several channels of continuous feedback among the patient, physician, professional case advisor, and health plan payor through custom designed interfaces, the system helps enhance patient compliance with the behavior modification program, and can help make  
20 the overall health care system more efficient.

#### BRIEF DESCRIPTION OF THE DRAWINGS

25 These and other aspects of the present invention will become more apparent from the following Detailed Description of a presently preferred embodiment of the present invention read in conjunction with the accompanying drawings and exhibits, in which:

FIG. 1 is a block diagram illustrating how feedback and monitoring is used in the current embodiment of the therapeutic behavior modification program's compliance monitoring and feedback system

30 FIG. 2 is an exemplary prescription form for inputting a patient's baseline vital factors;  
FIG. 3 is a graphical representation of a set of files for patients for whom recovery programs may be designed or modified;

FIG. 4 is a graphical representation of an exemplary patient file taken from among those represented in FIG. 3;

35 FIG. 5 is a graphical representation corresponding to the program Design option of FIG.4;  
FIG. 6 is a graphical representation corresponding to the Program Detail option of FIG. 5;  
FIG. 7 is an exemplary patient progress report;



1 FIG. 8 is a graphical representation of various interface tools, organized around a village motif, available to a clinical group patient;

FIG. 9 is a graphical representation of the system's Inner Core option;

FIG. 10 is a graphical representation of the system's Schedule Book option;

5 FIG. 11 is an expanded graphical representation of the Schedule Book;

FIG. 12 is a graphical representation of the system's Journal option;

FIG. 13 is an expanded graphical representation of the Journal;

FIG. 14 is a graphical representation of the system's Meeting Room option;

FIG. 15 is a graphical representation of the system's Coffee Shop option;

10 FIG. 16 is a graphical representation of the system's Post-office option;

FIG. 17 is a graphical representation of the system's Note option;

FIG. 18 is a graphical representation of the system's Postcard option;

FIG. 19 is a graphical representation of the system's Telegram option;

FIG. 20 is a graphical representation of the system's Audio E-mail option;

15 FIG. 21 is a graphical representation of the system's Kitchen option;

FIG. 22 is an expanded graphical representation of the Kitchen option;

FIG. 23 is a graphical representation of the system's Recipes option;

FIG. 24 is an expanded graphical representation of a Shopping List option;

20 FIG. 25 is an expanded graphical representation of an educational topic available through a pull-down menu in FIG. 22;

FIG. 26 is a graphical representation of the system's Gym option;

FIG. 27 is a graphical representation of a Stretching option of FIG. 26;

FIG. 28 is a graphical representation of a Strength Training option of FIG. 27;

FIG. 29 is a graphical representation of the system's Tranquility Park option;

25 FIG. 30 is a graphical representation of the system's Relaxation option;

FIG. 31 is a graphical representation of the system's Yoga option;

FIG. 32 is a graphical representation of the system's Library option;

FIG. 33 is a graphical representation of the system's Articles option;

FIG. 34 is a graphical representation of a World Wide Web access option;

30 FIG. 35 is a graphical representation of an educational topic available through a pull down menu in FIG. 32;

FIG. 36 is a graphical representation of the system's Travel Agency option;

FIG. 37 is an alternative user interface screen provided by the system;

35 FIG. 38 is a graphical representation of a log-on screen for a physician or case manager in accordance with another aspect of the present invention;

FIG. 39 is a graphical representation of a main menu available to a physician or case manager;

FIG. 40 is a graphical representation of an exemplary patient file;

1 FIG. 41 is a graphical representation of a blood pressure chart for an exemplary patient;  
FIG. 42 is a graphical representation of a physical activity chart for an exemplary patient;  
FIG. 43 is a graphical representation of a weight chart for an exemplary patient;  
FIG. 44 is a graphical representation of a cholesterol chart for an exemplary patient;  
5 FIG. 45 is a graphical representation of the system's Behavior option;  
FIG. 46 is a graphical representation of the system's Recommend option;  
FIG. 47 is an expanded graphical representation of the system's Communicate option;  
FIG. 48 is a graphical representation of the system's Video Conferencing option;  
FIG. 49 is a graphical representation of a main menu available to a health plan payor or  
10 employer;  
FIG. 50 is a graphical representation of a View Compliance Status option;  
FIG. 51 is a graphical representation of a View Comparative Costs option;  
FIG. 52 is a graphical representation through which the system indicates whether the  
patient has executed a limited waiver of confidentiality;  
15 FIG. 53 is another graphical representation of an exemplary patient record;  
FIG. 54 is a graphical representation of the system's Review Costs option;  
FIG. 55 is a graphical representation of the system's Review Outcomes option;  
FIG. 56 is a graphical representation of the system's Perform Utilization Review option;  
FIG. 57 is a graphical representation upon selection of an exemplary physician group of  
20 FIG. 55;  
FIG. 58 is an expanded graphical representation of a Communicate option of FIG. 48;  
FIG. 59 is a block diagram of the therapeutic behavior modification program's compliance  
monitoring and feedback system; and  
FIG. 60 is a flow diagram illustrating certain aspects of the therapeutic behavior  
25 modification program's compliance monitoring and feedback system.

To facilitate description of the present invention, reference is made in numerous instances  
to the flow diagram of FIG. 60. For convenience, the blocks in the flow diagram are numbered  
beginning at 1000.

## 30 DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, in a presently preferred embodiment of the invention, the patient 10,  
physician 12, case advisor 14, and health plan payor 16 (such as an HMO, insurance company  
35 or self-insured employer), all provide input to and/or receive output from the therapeutic  
behavior modification program's compliance monitoring and feedback system. The case advisor  
may be a doctor, nurse, and/or other trained medical professional experienced in case  
management protocols and practices. Patients electronically interact with the system, the case

1 advisor and their doctor through the system interface 18. The behavior modification program  
is customized to fit the health care and recovery needs of individual patients. The system  
provides at least two separate benefits: it helps the patient comply with the program through an  
electronically-implemented support mechanism; and further assists in monitoring such  
5 compliance.

A wide range of individuals can benefit from the system. By way of example only, these  
individuals include those with chronic ailments such as coronary artery disease, diabetes, chronic  
pain, depression, addiction, arthritis, cancer and asthma, as well as patients who are recovering  
from medical procedures such as angioplasty or by-pass surgery (the "clinical group").

10 Individuals who simply want to maintain their health and prevent or reduce the risk of  
such ailments (the "wellness group") can also benefit from the program. For these individuals,  
the program may be focused on stress management, diet, and exercise. The wellness group may  
further include family members of the clinical group who may need group support and/or  
counseling in dealing with the family member's chronic illness.

15 The members of the wellness group may not need all the features available to members  
of the clinical group. Furthermore, access to certain areas within the system may be limited  
and/or customized to meet the individual user's needs. However, wellness group members may  
choose to use the case management functions as a "virtual coach." For example, an individual  
may want to have a case advisor assist them in losing weight by helping the individual change  
20 his or her nutrition, exercise and stress management habits. The "virtual coach" or case advisor,  
can provide ongoing feedback and encouragement throughout the process. Wellness participants  
may also choose to join an on-line support group to help them achieve their health and wellness  
goals.

25 In an exemplary scenario, a physician diagnoses an individual with an ailment. The  
physician may then recommend a health care maintenance or recovery program which requires  
the patient to: take certain medications; participate in a support group; and control risk factors  
by altering his or her diet, following an exercise program, and managing stress levels.

The physician can then place the patient on the system to help him or her make these  
desirable or necessary lifestyle and behavior modifications. In order to subscribe the patient to  
30 the system, his or her baseline vital factors are entered. Such factors may include blood pressure  
readings, heart rate, height, weight, and cholesterol levels. Depending on whether the doctor is  
on-line (block 1000, FIG. 60), The doctor may input these vital factors into the system directly  
via his or her personal computer (block 1002, FIG. 60). Alternatively, the physician may fill  
out a prescription form and send the information to a case advisor, who then sets the patient up  
35 on the system (blocks 1004, 1006 and 1008, FIG. 60).

Referring to FIG. 2, an exemplary prescription form 22 contains identification information  
23 such as the patient's name and identification. Using the form, the physician selects a  
diagnostic category 24 and prescribes a recovery program level 26. In the exemplary

embodiment, eight separate diagnostic categories exist that correspond to the state of the patient's health. Category I, for example, includes patients who have suffered from a heart attack within the current year, while Category VIII includes patients who suffer from no particular ailment but are on the plan simply to promote wellness. Other categories may also be added as necessary.

Depending on the diagnosis, the physician may recommend that the patient cease smoking or that he or she lose a targeted amount of weight within a certain period by circling the appropriate response in field 30. The physician may also enter other information, such as the patient's medications 32. The physician then circles or fills in desired 3-month targets 34 relating to, among other things, daily calorie intake, percent daily intake of saturated fat, maximum heart rate, and cholesterol level.

Referring to FIG. 3, the case administrator sets up a new patient based on information contained in the patient prescription form or accesses the records of existing patients through patient files 40. In this example, the patient files 40 are identified by the patient's name and social security number. To create or modify the program for a particular patient, the administrator creates a new folder or selects a preexisting folder 42 corresponding to the patient in question.

Once the physician or case administrator enters the patient into the system, either the system or case advisor recommends a default set of goals based on the patient's needs and existing medical protocols that may be modified by the physician (blocks 1010 and 1012, FIG. 60). FIG. 4 illustrates an exemplary patient record after selection of the desired patient file 42 in FIG. 3. The record includes, among other things, the patient's current status and program goals. The first column 44 of the record sets forth fields for pertinent patient information including the patient's vital signs (e.g., weight, cholesterol level, blood pressure), other baseline characteristics (e.g., patient's smoking habit, physical activity, alcohol and eating habits, depression and stress levels, seat belt use), and information relating to any medications used by the patient. The second column 46 of the record sets forth the baseline values corresponding to the vital signs and patient characteristics at the beginning of his or her participation in the program. As shown in the third column 48, the record may be updated on an ongoing basis by taking data from the patient on-line and from subsequent office visits. Based on the patient's initial evaluation and/or short-term progress, the physician or case advisor can design a new program or modify an existing program for the patient by selecting the system's Design option 50.

Referring to FIG. 5, upon selection of the Design option 50 in FIG. 4, the system prompts the physician or case advisor to assign intensity levels 51 corresponding to the patient's diet, exercise, stress management, need for group support, anticipated compliance, and pharmaceutical requirements. The intensity levels in this example range from a lowest level of 1 to a highest level of 5. Other measures of program intensity may also be included.

1       Based on the input information, the system, case advisor or physician generates a set of  
goals 52 or milestones for the patient. This is done by correlating patient information such as  
age, sex, weight and information relating to the health, life situation and diagnostic category of  
the patient to established medical protocols for that type of patient. Other pertinent information  
5       that may be taken into account includes the patient's medication and other health conditions.  
Based on the correlation, the system suggests a therapeutic program including goals relating to  
intake of calories from fat, exercise level, stress management counseling, and group support and  
compliance management frequency. The physician or case advisor may view details as to how  
the suggested goals may be implemented by selecting the system's Program Detail option 54.

10       Referring to FIG. 6, upon selection of the Program Detail option 54, the patient record 60  
is presented along with the recommended one month goals 61 and final goals 62. The physician  
or case advisor may confirm 63 or edit 64 the suggested program to modify the goals by making  
appropriate selections (block 1012, FIG. 60).

15       The content of the patient records and the generated goals vary depending on the patient's  
diagnostic category. For example, some of the information shown on the patient record may not  
be necessary for an individual belonging to the wellness group. Information regarding calories,  
cholesterol level, blood pressure, and seat belt use, for instance, may not pertain to a person who  
is on the system to get support to help deal with a family member who suffers from a chronic  
ailment.

20       Referring to FIG. 7, the system also sends an exemplary patient status report 70 to  
physicians who do not have direct access to the system. The status report may include  
information regarding a patient's current status 66, suggested next steps 67, and target goals 68.  
Other information may also be included in the status report as desired by the physician. The  
physician has the option to agree with the suggested next steps 69 or indicate changes to the  
25       program. The physician then sends the report 70 back to the case advisor for modification of the  
program as necessary. Communication may take place via e-mail, facsimile, or any other method  
of transferring data.

30       Once the patient is set up on the system, it assists him or her in complying with his or her  
behavior modification program (block 1020, FIG. 60). To use the program, the patient logs into  
the system network via telephone line, cable modem, cellular connection, satellite link or other  
communication method that allows for a connection into a network server.

35       Referring to FIG. 8, in a presently preferred embodiment of the invention, the user  
interface for patients in the clinical and wellness groups is organized around a village motif. The  
user progresses through the system by following paths through a graphically represented town  
square to destinations including the village gymnasium 71, tranquility park 72, post office 74,  
coffee shop 76, store 78, library 80, travel agency 82, as well as the user's own "home" 84. The  
village motif presents the patient with an image of a community of support. The entire on-line  
community revolves around his or her recovery and well-being, and this helps bolster the

1 patient's confidence and motivation. Furthermore, the village motif provides an easy-to-understand representation of the system's structure. The patient learns to navigate the system more quickly and easily because of the intuitive town layout.

5 Another benefit of the village motif is its familiarity. A patient afraid of technology will be reassured through the symbolic images of home and neighbor, street and store. Finally, the patient may find navigating an electronic "neighborhood" more enjoyable than a traditional text-menu-driven system. Other user interfaces, such as the one described in conjunction with FIG. 37, are available.

10 Referring to FIG. 9, the inner core 86 of the village provides the user with a schedule book icon 90, a journal icon 94, a meeting room icon 96, a mail icon 98, and a rewards icon 92. These give the user access to additional tools that assist with complying with his or her health program, and further help the physician or case advisor monitor such compliance.

15 Referring to FIG. 10, upon selection the schedule book icon 90 from the interface of FIG. 9, the system displays a graphical representation of a schedule book 90A. As shown in FIG. 11, the schedule book presents the user with a list of meetings that the user can participate in via his or her computer. The list of meetings varies for each user depending on his or her specific health recovery program. The schedule book also presents general information on the meetings, including time 100, date (not shown), and meeting profile 104, with a notation of how many people have signed up for the meeting 106. The system also sets a limit on the  
20 maximum number of individuals that may sign up for a meeting.

Based on this information, a user may then sign up for the meeting that best fits his or her schedule. Other factors, such as the city in which the other members are located 108 may also influence the user's choice. A user may decide to join a group whose members are located in his or her home city if he or she wants to meet these people face-to-face someday.

25 The system integrates the user's schedule book 90A with the user's personal electronic daily calendar. For example, after a patient signs up for a meeting, the system downloads the day and time of the meeting to the user's calendar. The calendar may be any suitable commercial calendar or organizer program, such as Organizer <sup>TM</sup> available from Lotus Development Corp.

30 In an alternate embodiment, the user may make a further request via the schedule book for automated reminders to be sent to him or her by e-mail.

Referring again to FIG. 9, the system also enables the user to access an integrated patient journal 94 from the village's inner core and self-report their progress and describe their feelings. Selection of a journal icon leads the user to a journal 94A like one shown in FIG. 12.  
35 Upon entering the journal 94A, the user has the option to view the personal goals that have been set for him or her by the physician or case administrator. The journal also provides a diary used to make a daily record of information pertinent to accomplishing the user's goals. The journal 94A provides an important tool that lets the patient express his or her feelings and fears in a

1 context other than that of a support group. By journaling, the patient can identify fears  
concretely, and thus begin to address them. Goal setting is also often more meaningful when it  
is written down. Instead of merely thinking about ambiguous hopes, patients can define in  
5 written form the concrete milestones they plan to attain. These notes can also help remind the  
patient of matters he or she might wish to discuss in support group meetings. The system also  
uses certain notations in the journal to assist in generating reports to the physician or case advisor  
regarding the patient's progress. As part of its overall security measures, the system separates  
those journal entries which the patient wishes to keep private from those which are to be used  
in generating reports.

10 FIG. 13 exemplifies the type of information which may be contained in the journal. For  
instance, a heart patient belonging to a clinical group may need to monitor his or her emotions  
100 as well as the exercises he or she has been doing 104 by means of the journal. Depending  
on the patient's program, the system might also prompt the patient to input his or her vital signs  
102, such as blood pressure and heart rate, in the journal. This can be done manually or  
15 automatically. For example, devices can be hooked into the computer's serial port for automatic  
input of blood pressure and heart rate into the system. Depending on the particular program,  
patients might be required to weigh themselves on a weekly basis and/or measure their  
cholesterol level with a home cholesterol kit on a relatively less frequent basis. This information  
is stored in the system's database and is accessible to the physician and case advisor.

20 The kind of information required of a person in the wellness group may differ from this.  
For example, if a user is in the wellness group because a family member is suffering from a  
chronic illness, it will not be necessary for him or her to input vital signs into the journal.  
Rather, information as to how he or she is doing emotionally, as well as information as to how  
much group support he or she is getting, may be solicited.

25 The user may also record his or her personal comments in the journal. This information  
may only be viewed by the individual user, and is not available to the case advisor or physician.

The journal is also integrated with the user's daily calendar. The user may, for example,  
input information as to his or her exercise schedule (such as 30 minutes walking on Tuesdays,  
Thursdays, and Saturdays) or meditation schedule into the journal. The system then downloads  
30 this information into the user's daily calendar. Previous journal entries may also be viewed.

In addition to allowing the patient to electronically enter his or her updated health  
information, the journal also provides the physician or case advisor with a means of getting  
feedback on the patient's progress. The information recorded in the journal is electronically  
forwarded to the case advisor. Alternatively, the case advisor has direct access to portions of the  
35 journal stored in the system's database. The physician or case advisor can use the information  
provided in the journal to update the program on an on-going basis.

1           The system also accepts additional patient data obtained during office visits or directly  
from the patient via e-mail or other means of communication. The physician may also input  
additional data, such as that derived from laboratory tests, into the system. Accordingly, the  
system accepts updated patient data directly from the patient and through data entered by the  
5           physician during office visits (blocks 1030, 1032 and 1034, FIG. 60).

          The system automatically correlates the patient's input with the physician's to check  
for accuracy. In addition, the system automatically provides the physician with reports of  
patient progress. Depending on the patient's plan requirements, the case advisor periodically  
reviews the patient-reported and physician-reported input to monitor whether the patient is  
10          complying with program parameters and meeting goals (block 1036, FIG. 60).

          As part of the feedback process, the system provides an "alarm" option (block 1040,  
FIG. 60). The system compares actual data about the patient with the goals and parameters  
residing in the system's database and automatically notifies the physician or case advisor via  
e-mail or facsimile (or pager depending upon the severity of the problem), if a health risk is  
15          present (block 1042, FIG. 60). For instance, if a patient's current blood pressure is potentially  
dangerous, the system will automatically send an alarm to the physician or case advisor and  
require his or her immediate action.

          If the difference between current data and goals does not present a threatening situation,  
the system will simply notify the physician or case advisor that these goals are not being met.  
20          For example, if the current data states that the patient has lost 5 pounds instead of 10, the  
system will notify the physician or case advisor of this fact. This information, although not  
life-threatening, must nonetheless be addressed by the physician or case advisor. He or she  
may then contact the patient in order to support and to further motivate him or her to meet  
the desired goals (block 1044, FIG. 60). In addition, the physician or case advisor may  
25          recommend that the program be modified to suit the patient's condition (block 1046, FIG. 60).

          Regardless of whether an alarm condition exists, the system periodically correlates the  
updated patient health information with the program goals to determine the patient's progress  
and compliance with the program (block 1050). If the patient is progressing in accordance  
with his or her program, the system informs the physician and/or case advisor (block 1052,  
30          FIG. 60). The physician or case advisor may then provide positive reinforcement to the  
patient. Depending on the patient's progress, the case advisor or physician can also determine  
whether to modify the program by altering the goals or moving the patient into a different  
diagnostic category. The patient may even be removed from the system if he or she has met  
program end goals (blocks 1054, 1056, FIG. 60).

35          The system also notifies the physician or case advisor if the patient is not progressing  
toward program goals or is not using the system (block 1060, FIG. 60). The case advisor  
along with the physician then determines whether to modify the patient's therapeutic program,



1 provide the patient with additional support, or remove the patient from the system (blocks 1064, 1066 and 1068, FIG. 60).

5 The system also enables direct feedback to the individual user. As one of the features of the journal, users may view their levels of compliance and achievement of goals. Patients may not recognize they are making progress until presented with reminders of how much they have improved. System generated charts and summaries, discussed below with respect to FIGS. 41 to 44, provide patients with an overview of how far they have come.

10 Referring again to FIG. 9, as another tool to assist patients to comply with their programs, the system offers an electronic meeting room and group support room interfaces via meeting room icon 96 through which a patient receives on-going, on-line group support. Putting a patient in contact with people with the same or similar problems through group counseling has clinically-proven therapeutic benefits. The system facilitates this process through the use of electronic and on-line technologies. On-line group counseling solves many of the logistical difficulties encountered in bringing together, on a regular basis, a large group of people with different schedules who live in different places. Instead of requiring patients to travel physically to a single location, the system enables them to attend group meetings by simply logging on to their computers. As the burden on the individual patient decreases, group attendance increases, and this enhances the overall practical, therapeutic value of group counseling and support.

20 On-line counseling also brings a patient into contact with a wider pool of people with similar problems than traditional counseling can. When desirable or necessary, group membership can be drawn from people in a wide variety of regions, instead of being limited to a single vicinity.

25 Furthermore, the relative anonymity of electronic communication benefits patients who are reserved or possibly embarrassed by their situations. These patients may be more willing to share their feelings in an on-line environment than they would be face-to-face.

30 Patients have access to the meeting room interface via a meeting room icon 96. Upon selection of the meeting room icon 96, patients are presented with meeting rules and regulations. They may then proceed to a pre-scheduled meeting. Only those scheduled for a meeting will be permitted to attend. The scheduling of meetings is part of the schedule book interface explained above in conjunction with FIGS. 10 and 11.

35 Referring to FIG. 14, each participant 112 may chose to represent him or herself in one of two different ways in the meeting room. The participant 112 may have his or her photo scanned to represent him or her in the system. Alternatively, if anonymity is desired, the patient may choose to be represented by a non-photographic icon, or "avatar," accompanied by either his or her own name or a pseudonymous screen name. The patient will then be represented by that avatar in group meetings and private mentoring sessions. In some cases, patients may choose to design and construct their own avatars.

1 A trained, experienced leader or chairperson 114 is an important part of these group  
counseling sessions. It is the chairperson's responsibility to guide the discussion and encourage  
participation from all members. To enhance the beneficial aspects of group counseling, the  
system allows the chairperson 114 to access selectively certain parts of the patient's on-line  
5 journals and electronically display the selected portion in an anonymous manner to the on-line  
group. The chairperson can also cut somebody off electronically if he or she is saying things  
that are inappropriate.

In the preferred embodiment, a participant 112 "speaks" during the meeting by entering  
text at 122. Upon hitting the enter key, this text appears as "bubble-talk" 116 above the  
10 representation of the participant 112 who entered the corresponding text. In an alternate  
embodiment, instead of using a "bubble-talk" format, each participant 112 may participate at  
the meetings by talking into a microphone connected to his or her PC, and listening to other  
participants via speakers also connected to the PC.

A log window 110 keeps a running or scrolling record of the conversations during the  
15 meeting. Thus, if a participant 112 loses track of the conversation, or wants to comment on  
something said earlier, he or she has access to the entire conversation as reference.

During group counseling meetings, a chairperson 114 may play on-line multimedia  
presentations featuring other patients or well-known figures who have made positive lifestyle  
changes. In the presently preferred embodiment, each participant has access to the multimedia  
20 presentation, such as a video clip, via CD-ROM or DVD received by mail on a regularly  
updated basis. Alternatively, if the user has access to the appropriate software and hardware,  
and has a connection of sufficient bandwidth to the server, the multimedia presentation may  
be streamed to him or her over the network. In addition to CD-ROM, the system can also  
use DVD disk, downloads to the user's computer hard drive, or any other method or medium  
25 capable of storing or transmitting audio and video data.

When it is time to view the multimedia presentation, the chairperson selects, for  
instance, a particular video clip from a menu of video clips available on his or her CD-ROM  
or DVD. This sends a signal via the network to each participant's PC. The signal received  
matches a code on each participant's CD-ROM or DVD, which triggers the playing of the  
30 selected video by the PC. If the video is stored on DVD disk or on the user's computer hard  
drive, or some other storage medium, the video could be triggered to play from that medium  
as well.

The participants may not play the video prior to the meeting because only the  
chairperson has access to the code which releases the video. Thus, prior to a meeting, users  
35 may view a list of videos in his or her CD-ROM, DVD disk, hard drive, or other storage  
medium, but videos which have not been shown already at meetings will be inaccessible for  
viewing. Once a video is released by a chairperson and played for the first time at a meeting,  
the participants may access it any time thereafter.

1           The case administrator or advisor knows in advance who the chairperson for a meeting will be and will give him or her access to the video clip to be shown at that meeting.

5           The multimedia presentations shown at the meetings may feature well-known or public figures and other patients who may have dealt with the same issues that the participants are facing. For example, in a meeting for patients who have suffered heart attacks, a video clip of a celebrity who recovered from a similar problem may be shown. In the clip, the celebrity would talk about his or her own heart attack, the bypass surgery that he or she underwent, and the depression that followed. The celebrity would also describe other struggles that he or she faced, and how these struggles were overcome during the recovery process. Likewise, video clips of program participants may also be used to provide motivational examples of success stories, or to express deep-felt emotions (e.g., anger, depression, etc.) that must be dealt with by that individual and other members of the group in order to be successful in his or her recovery.

10           Such presentations may act as a source of motivation to the participants, giving them a sense of hope. If someone else was able to overcome the same obstacles, they can too.

15           The presentations may stimulate further discussion during the meeting, and allow participants to open up about the issues and struggles that they are facing during their recovery process.

20           Another function provided by the meeting room 96A interface is electronic telephone dialing. Each participant has a phone icon 118 in front of his or her avatar. If a participant wants to talk to any other person in the meeting, he or she may click on the phone icon and the telephone number to that person is dialed automatically. This allows the members to contact each other after meetings to talk further via regular phone lines if desired. The conference room participants also have direct access to a more private mentoring area by clicking on a coffee shop icon 76B. Users of the system may also gain access to this private mentoring area by selecting the coffee shop 76 from the village as shown in FIG. 8.

25           FIG. 15 is an exemplary illustration of the inside of the coffee shop 76B. Conversation here occurs much like in the meeting room 96A, except for the fact that the conversation is not monitored and structured by a chairperson. Text is inputted at 132 and appears as bubble talk at 134. A record of the conversation is also kept at the log window 130.

30           In the preferred embodiment, the system allows a maximum of four people into a single coffee shop at a time. Such a restriction is desirable given that the purpose of the coffee shop is for one-on-one mentoring. In the private setting of a coffee shop, more experienced individuals can pass on their experiences to less experienced ones as well as advice as to how to overcome the obstacles that they may be facing.

35           The group support room 96A and coffee shop 76B applications are implemented by means of third-party chat room applications such as Palace, commercially available from The Palace, Inc., Beaverton, Oregon. The chat room applications may be integrated into the

1 system and modified to provide additional functionality. Triggering of multimedia presentations during group meetings and the monitoring of attendance are separately programmed into the system.

5 Through on-line group meetings and private mentoring rooms, the system allows patients to maintain contact with other people who have the same or similar problems, all in entertaining ways that encourage and assist the patient to adhere to program parameters and achieve program goals.

10 The communications feature of the system further allows users to keep in constant contact with their physician, case advisor, or other users of the system. Although in the presently preferred embodiment of the invention communication is done via e-mail, other methods of communication may also be used. For instance, it is envisioned that the system will allow instant messaging, conference calls, and/or video conferencing as alternate means of communication.

15 Referring again to FIG. 9, the mail icon 98 gives a user access to the e-mail feature. A user may also access his or her e-mail by selecting the village post office 74 shown in FIG. 8.

Referring to FIG. 16, the system includes four different types of e-mail options: letters 140, postcards 142, telegrams 144, and audio e-mail 146.

FIG. 17 is an example of a letter 140A, which functions as standard e-mail.

20 FIG. 18 is an example of a postcard 142B, which may be used to send short notes. For instance, postcards may be sent to users to survey the level of satisfaction with the service provided by the system. The postcard would contain questions on this issue, and users would be asked to send the postcard back after having answered the questions.

25 FIG. 19 is an example of a telegram 144A, which has the highest priority among the types of e-mail provided by the system. The telegram may be used, for instance, to alert a user that he or she has missed a meeting, or just as a short note of encouragement by the case advisor or group leader to an individual user.

FIG. 20 is an example of an audio e-mail 146A notification. Upon clicking this icon, users can hear a recording of the message sent to them via speakers attached to their PCs.

30 The communications functionality may be implemented by integrating any one of a number of conventional e-mail programs with the system.

35 As will become more apparent from a detailed description of the system's other interfaces, the system takes a two-pronged approach to behavior modification: education and motivation. Entertainment is used as a means of both educating and motivating a user to make the sometimes difficult changes required for recovery or even for maintaining a healthy lifestyle.

1 Motivation is one approach to behavior modification. It is the path from education to  
compliance, which is a goal of the system as a whole. The support group and case advisor  
described above add a human element to this motivational component. Patients are more  
likely to respond positively to the encouraging words of others than they would be to a  
5 program which must be followed in isolation.

The system's multimedia capabilities allow it to use graphics, videos, and music to  
communicate and educate. These features provide a refreshing boost to the patient's endeavor  
to modify his or her behavior, replacing the drudgery typically associated with clinical medical  
rehabilitation programs. Segments featuring celebrities, medical experts, motivational speakers  
10 and successful program participants delivering motivational speeches and personal testimonials  
further inspire the user. Humor is integrated throughout the system, for example in the  
whimsical artwork. The entertainment derived from these features of the system is used to  
spark and maintain the patient's interest in the unfolding drama of his or her recovery and  
lifestyle change.

15 The rewards feature is yet another motivational tool provided by the system. Referring  
again to FIG. 9, the reward "apples" icon 92 allows a user to view information on the rewards  
point system and how it works, as well as the user's own personal rewards account. Users  
may earn points by good participation in the program and by reaching certain milestones. For  
instance, points may be earned for good attendance at meetings, good participation during the  
20 meetings, chairing a meeting, or losing a certain amount of weight, if this was a goal to be  
accomplished.

Rewards range from the symbolic kind, such as getting "gold stars" that commend a  
user for his or her progress, to reward points and frequent flier miles which may be  
exchanged for goods in the village store 78 or plane tickets in the village travel agency 82,  
25 respectively.

Education is a complementary behavior modification approach offered by the system.  
Education is provided through informative on-line multimedia presentations and the interactive  
areas of the village devoted to diet, exercise, and stress management. For example, the  
recipes provided in the village kitchen, discussed below in conjunction with FIGS. 21-24, are  
30 designed to improve patients' diets without forcing them to take on impossible austerities or  
give up their love for food.

Exercise and stress management programs, discussed below in conjunction with  
FIGS. 26-31, are designed both to allow for variety and to lie within the individual patient's  
ability range. By making exercise and a healthy diet both feasible and interesting, the system  
35 enables patients to stick with their new lifestyles.

The system also provides relevant articles and includes hyperlinks to other, reputable  
Internet sites devoted to providing medical and health-related information, as discussed below  
in conjunction with FIGS. 32-35.

1 Referring again to FIG. 8, the system encompasses a "home" 84 interface as part of the village motif. Upon its selection, a screen showing the inside of the user's "home" 84 follows, as depicted in FIG. 21. Once inside his "home" 84, the user may access the kitchen by selecting the kitchen icon 150.

5 FIG. 22 illustrates the interior of the user's kitchen 155. Once in the kitchen 150A, users have the option to get nutritional and dieting information from low-fat cookbooks 153, or view and print recipes from a recipe book 154. FIG. 23 gives an example of a recipe which may be contained in the recipe book 154.

10 Referring again to FIG. 22, users also have the option to prepare and print a shopping list 156. A user may chose several recipes from the recipe book 154, and the system can automatically enter the ingredients into the user's shopping list 156. The user can also manually enter items into the shopping list 156 via his or her PC keyboard. FIG. 24 gives an example of a user's shopping list.

15 The system can also indicate which recipes are allowable under the particular patient's program. For example, the system might recommend certain low-fat items that meet the criteria of a patient's program as well as suitable foods he or she might consider when eating out. The system is also capable of generating weekly shopping lists based on program parameters. According to personal preference, users may choose to substitute certain allowable foods for other.

20 Moreover, users have access to a pull-down computer menu by selecting the computer menu icon 152. From this computer menu, users can access various educational topics related to food, nutrition, and diet. One such topic may, for instance, relate to the basic food groups and may provide information as to the suggested amount of servings for each category of food, as shown in FIG. 25.

25 The guest chef 158 option shown in FIG. 21 further allows users to view audio or video clips of a chef showing how to prepare a certain recipe. In the presently preferred embodiment, these clips are contained in the user's CD-ROM or DVD, but with proper technology could be sent via streaming audio or video.

30 From the kitchen, a user may substitute foods (e.g., asparagus for broccoli); access and print food related articles; view new recipes or articles by selecting the "what's new" button (not shown); or join a discussion group via a bulletin board (not shown).

35 Referring again to FIG. 8, another part of the village motif is the village gymnasium 71, which is used by the system to make recommendations or supply information regarding suitable exercise routines. Each exercise program is generated according to individualized parameters and needs, with progress being regularly charted by user input via the journal 94A (FIGS. 12-13).

1        Upon entering the gymnasium 71, a user may view featured video clips or listen to  
audio clips; do key-word searches to access and print exercise related articles; read and print  
exercise manuals; or join a discussion group via a bulletin board.

5        FIG. 26 illustrates the inside of a gymnasium 71 shown in FIG. 9. Shown here are  
various exercise topics 160 that a user may access. For instance, selecting the stretching topic  
162 gives the user information on recommended exercises for stretching different muscle  
groups. FIG. 27 illustrates one such stretching exercise.

10       Similarly, selecting the strength training topic 164 gives the user information on  
recommended exercises to help strengthen various muscle groups. FIG. 28 illustrates one such  
strength training exercise.

15       Referring again to FIG. 9, the village tranquility park 72 focuses on stress management  
strategies, including relaxation techniques, biofeedback, yoga, and meditation. Upon entering  
the park 72, a user may access and print articles on stress management subjects; view video  
clips or listen to audio clips on these subjects; and join discussion groups via a bulletin board.

20       An expanded illustration of the tranquility park 72 is shown in FIG. 29. Upon selection  
of the relaxation option 170, an instructional article on the subject is invoked, as shown in  
FIG. 30. Similarly, upon selection of the yoga option 172, an instructional article about yoga  
is invoked, as shown in FIG. 31.

25       Referring back to FIG. 8, the system also gives access to a village library 80 which  
allows users to do research germane topics. Thus, patients interested in learning more about  
their medical condition may access the library 80 in order to educate themselves on the topic.

30       FIG. 32 illustrates the interior of the library 80. From here, a user may select an  
Articles option 180 to gain access to an available list of articles 186 via his or her CD-ROM,  
as shown in FIG. 33. The kind of articles 186 available to a user will vary depending on the  
type of user. For instance, if the user suffers from a chronic cardiac condition, the articles  
186 will all relate to such topic. The list of articles 186 is updated on an ongoing basis to  
reflect new developments and research on the topic.

35       Users are also provided with hypertext links 188 to other reputable Internet sites  
devoted to providing medical and health-related information. These Internet sites may also  
be accessed by selecting the world wide web option 182 as shown in FIG. 32.

40       Once linked to an Internet article, a user is taken to a separate web browser from which  
he or she may navigate the web. FIG. 34 is an example of an Internet site to which a user  
might get connected upon selection of the world wide web option 182 of FIG. 32.

45       Furthermore, users have access to a pull-down menu by clicking the menu icon 184.  
From this menu, users can select various educational topics germane to the user's condition.  
For instance, an article available through the pull-down menu may teach a user suffering from  
a chronic cardiac condition how to determine his or her target heart rate zone, as shown in  
FIG. 35.

1 Users may also do key word searches to access and print articles of interest, to view  
featured video clips, or listen to audio clips.

Referring again to FIG. 8, the village store 78 and travel agency 82 are two additional  
interfaces accessible to users. Upon entering the store 78, users are taken to an in-house or  
5 third-party web site through which they may order relevant items, either on-line or by  
telephone.

Users may also search the store database and view product information, including  
pictures, descriptions, and prices of products. Moreover, users may view the status of their  
orders and contact customer service via e-mail or telephone.

10 Similarly, when a user enters the travel agency 82, he or she is linked to a third-party  
co-branded reservation system. FIG. 36 illustrates the inside of travel agency 82. From here,  
a user may make on-line travel reservations by selecting a Reservations option 202. A user  
may also view the frequent flier miles he or she has accrued so far by selecting a Check  
Reward Points option 200. As discussed above, a user may gain frequent flier miles by good  
15 participation in the program and reaching certain milestones.

Although the user-interface for clinical and wellness group members has been described  
in terms of a village motif, an alternative user-interface could incorporate another alternate  
embodiment of the system interface shown in FIG. 37. A multi-frame screen is shown which  
includes: a main navigation area 210; content area 212; message or video screen area 214; and  
20 an instructions area 216. The message or video screen area 214 may be used to show  
advertisements. The instructions area 216 may be used as a "What's New" area or for the  
bulletin board functionality discussed above for the kitchen 150A (FIG. 22), gymnasium 71  
(FIG. 26), and tranquility park 72 (FIG. 29) interfaces.

FIGS. 38-47 and 49-58 illustrate user interfaces for the case advisor and HMO, some  
25 of which are also accessible by the patient. Unlike the user interface for patients, the  
navigation for the physician/case advisor is generally less graphical and more chart oriented.

Referring now to FIG. 38, a log-on screen 220 for the user interface for a  
physician/case advisor is shown. The screen 220 requires the physician or case advisor to  
input their name 222 and corresponding password 224. Screen 220 thus acts as a security  
30 measure by ensuring that only legitimate users are able to gain access to the system.

Referring to FIG. 39, an initial screen containing a main menu 230 of the options  
available to the physician/case advisor follows the log-on screen 220. A Design Program For  
Patient option 232 allows a physician/case advisor to create a new program or modify an  
existing program for a patient, as described above in conjunction with FIGS. 3-6.

35 A second option within the main menu 230 is a Review Patient Record option 234  
which allows a physician/case advisor to review the health record of a particular patient.

A list of current patients (not shown), substantially similar to the list shown in FIG. 4  
follows upon selection of a Review Patient Record option 234.



1 Referring now to FIG. 40, a health record of an exemplary patient is shown. The record may provide identifying information, including the patient's name 240, subscription ID 242, and social security number 244. Furthermore, information as to the total amount of time that the patient has been participating in the program may be given as shown at 246.

5 Column 258 shows the patient's vital signs and other health-related factors, such as blood pressure 250, number of cigarettes smoked per day 252, amount of physical activity 254, weight 256, and cholesterol level 258. Some of these factors may be monitored and reported on a weekly basis, as shown in columns 260-268. Other factors, such as the patient's cholesterol level 258, may be monitored and reported on a bi-weekly basis, as shown in  
10 columns 260, 264, and 268. The ultimate goal to be achieved in each of the specified areas is given in column 272.

A list of the risk factors which may affect the patient's recovery may further be pinpointed as shown at 270.

15 -Vital signs may be represented graphically for the patient, physician and case advisor. These may include charts or graphs of the patient's blood pressure 250A (FIG. 41), physical activity 254A (FIG. 42), weight 256A (FIG. 43), and cholesterol level 258A (FIG. 44). These graphs allow the physician/case advisor to review and grasp the patient's progress visually over a period of time, and help him or her determine how the patient is doing in relation to the ultimate goals that are to be achieved in the charted areas.

20 Referring again to FIG. 40, a physician/case advisor is also given an option 274 to assess the patient's behavior. Upon selection of this option, the system provides a behavioral change assessment form 305 like the one shown in FIG. 45. This form 305 is used to determine how inclined the selected patient is toward complying with the recommended program. In the preferred embodiment, on-line questionnaires are submitted to the patients,  
25 asking them to rate their behavioral intention 300, self-efficacy 302, and social support 304. Alternate forms of evaluation may also be used to assess the likelihood of a patient's compliance with the program.

30 The system periodically assesses and reports the patient's behavioral change as shown in columns 306 and 308. The desired goals 310 are also listed to monitor whether the patient is making progress towards them. If a patient continues to score low on the behavioral change assessment form 305, this may indicate that he or she is unable to change his or her lifestyle, and lead to the conclusion that the patient should be taken off the system.

35 The system generates reports on patient progress based on the data shown in FIGS. 40-45, as frequently as the physician desires. These reports can be received via either e-mail or facsimile. The frequency of reports will depend on the needs of the particular patient, and may be triggered by the achievement of goals or the setting off of alarm signals as described above.

1           The system can also generate regularly scheduled reports for a physician's review on a default basis, depending on a patient's needs. For example, patients who are relatively ill can be reviewed twice a week or more, even if no warning signals occur.

5           Upon receiving feedback from the system regarding changes to a patient's behavior modification program, a physician or case adviser may want to make recommendations about the program. FIG. 46 shows an exemplary recommendation screen which follows the selection of a Recommend 276 option of FIG. 40. If, for example, a patient initially placed on a program of walking 15 minutes three times a week loses 5 pounds and lowers his or her blood pressure, the system might generate a report to the physician recommending an increase  
10           in the patient's walking time to 45 minutes per session as shown at 322. The system may further make recommendations as to the frequency and duration of stress reduction exercises 328 as well as on other areas of the program as shown at 326. The physician reading the report can accept 330 or modify 332 the recommendations.

15           The system's reporting features enable a physician to handle more patients in the same amount of time without decreasing the quality of care. The system also allows for a patient feedback loop independent of this self-monitoring capability. If the patient has a difficult night, for example, he or she can send an e-mail through the system directly to the case advisor or the physician via the mail 98 (FIGS. 9, 16-20) or post office 74 (FIG. 8) interfaces.

20           Once the physician/case advisor is satisfied with the recommendations, he or she may electronically communicate 334 program changes to the subscriber.

          FIG. 46 also shows an example of a patient who has earned reward points 324 for not having smoked for 60 days. The reward points shown here are to be cashed in at the village store 78 shown in FIG. 8.

25           Referring to FIG. 47, the system presents a message screen upon the selection of a communications 334 option of FIG. 46. The case advisor may send the recommendation 346 made by the system and reviewed and/or modified by the physician, to the subscriber 340 with an attached audio e-mail message 344, or alternately via text e-mail or facsimile. A copy of the recommendation 346 and message 344 may also be stored in the system's database 342.

30           Physicians/case advisors may further communicate with patients by video conferencing. An existing third-party video conferencing package may be integrated to the system to allow the video conferencing feature. The minimal requirements for a PC to support the video conferencing capability is a clock cycle of 90 megahertz, 24 megabytes of random access memory, a color camera, a video capture board, an audio board, a video input capture board, and an ISDN line. The technical specification may change as technology affecting bandwidth  
35           and/or data compression changes.

          As shown in FIG. 47, the video conferencing feature may be accessed upon selection of a video conferencing option 347. A video conferencing manager, like one illustrated in FIG. 48 may then be used to conduct the video conference.

1 A health plan payor, such as an HMO, insurance company, or self-insured employer,  
may also access the system. Information that is released by a patient may also be sent  
electronically to the health plan payor. The information can then be combined with the  
5 provider's information to analyze individual patients or aggregate results of all people on the  
program. The analysis may include, for example, cost per patient, cost for patients in each  
category or group, and physician utilization. The system's relational database that allows for the  
custom gathering of data, depending upon the requirements of the health plan. The system may  
also provide aggregate reports to the health plan payor for management review and cost  
10 control purposes. A health plan payor may be less interested in looking at individual patient  
files and more interested in looking at information as to the number of subscribers on the  
system, the cost of keeping the subscribers on the system, and how this cost compares to that  
incurred by patients who are not on the system. At the same time, several layers of electronic  
security measures insure the individual patient's privacy by strictly segregating the type of  
information available to the various parties who have access to the system.

15 The user interface for the health plan payor is similar to the user interface used by a  
physician/case advisor. When the health plan payor signs onto the system, a main menu  
screen with a list of options available is provided, as shown in FIG. 49. From here, the payor  
may choose to view overall compliance status 350, perform case management review 352,  
perform an utilization review 356, review outcomes 354, or communicate 358, each of which  
20 options is described in further detail below.

Upon selection of a view compliance status 350 option, the health payor views current  
compliance status based on pre-determined categories 360, as shown in FIG. 50. For each  
category, information as to the total number of eligible patients 364, number of participating  
patients 366, participating patients complying with the program 368, participating patients put  
25 on probation due to lack of compliance 372, and patients terminated 376, may be displayed.

A comparative cost analysis screen is also invoked via a view comparative costs option  
362. FIG. 51 shows an example of the cost of maintaining patients on the system. The total  
cost 380 may be compared against costs incurred by a control group of patients who have not  
subscribed to the system 382. Comparative savings achieved by use of the system are shown  
30 in column 384.

Referring back to FIG. 49, the main menu 348 also includes a perform a case  
management review 352 option. A list of current patients (not shown), substantially similar  
to the list shown in FIG. 4, follows selection of this option.

35 Once a patient file has been selected, a confidentiality waiver information 390 is  
displayed, as shown in FIG. 52. A patient will be assured confidentiality and privacy in the  
areas where waiver has not been given. For instance, portions of the patient's journal will be  
kept confidential and unavailable to the health plan payor, ensuring that patients remain open  
and honest in making daily journal entries.

1           Upon selection of a continue option 392, a screen similar in content to the screen  
shown in FIG. 40 is shown in FIG. 53. As with the user interface for physicians/case  
advisors, indications of the patient's blood pressure level 404, physical activity 406, weight  
408, and cholesterol levels 410 over time, are given. These may also be represented  
5           graphically to the health plan payor in a form substantially similar to FIGS. 41, 42, 43, and  
44 respectively.

A health plan payor, however, has a review costs option 400 which is not available to  
a physician/case advisor.

10          FIG. 54 illustrates an exemplary screen viewable upon selection of the review costs  
option 400 of FIG. 53. Shown here is information as to the costs incurred to date in  
maintaining the selected patient on the system. The system costs 410, health service costs  
412, and total costs 414 are represented in a bar graph format in this particular example. The  
cost incurred by a control group patient who is not on the system is also shown 418. This  
cost is compared to the total costs 414 and the amount of savings 416 thus achieved, and is  
15          also displayed in a bar graph format.

Referring back to FIG. 49, another option provided by the main menu 348 is a review  
outcomes 354 option, which provides a screen like the one shown in FIG. 55 with information  
as to the various patient outcomes, based on various pre-determined categories. For instance,  
information as to the percent of compliant subscribers who had an emergency room ("ER")  
20          visit 420 is shown. This information may be compared against ER visits made by non-  
compliant subscribers 422 and control group patients who have not subscribed to the system  
424.

Referring back to FIG. 49, the main menu 348 also provides for a utilization review  
356 option. As shown in FIG. 56, upon making this selection, a screen appears with  
25          information including the name of the group or facility using the system, this group or  
facility's specialty 432, the number of cases to date 434, the percentage of cases referred to  
the system 436, and how this percentage compares 438 to the targeted utilization percentage  
440.

30          Upon selection of a particular group or facility 442, the same type of information for  
the doctors within the selected group or facility 442 may be obtained, as shown in FIG. 57.

The main menu 348 in FIG. 49 further provides a communicate 358 option leading to  
FIG. 58. The health plan payor may send an audio e-mail 456, text e-mail 458, or fax 460  
to the case advisor 450, responsible physician 452, or subscriber 454 as shown here.

35          In this way, the system provides an on-going loop of compliance monitoring and  
feedback to help the patient make difficult lifestyle changes. Once the patient has achieved  
the desired goals, he or she can continue to use the system as a health maintenance or  
wellness program. An aim of the system is to educate and motivate patients to take control

1 of their lives and improve their health by modifying their behavior and changing their lifestyles.

FIG. 59 is a block diagram of the present system. It will be apparent to those skilled in the art that the invention described herein may be implemented on various platforms. In a preferred embodiment, however, patients, physicians, case advisors, and health plan payors have access to a PC 500 with a Pentium microprocessor. The PC 500 contains audio and CD-ROM 502 capabilities. However, a PC 500 may have other multimedia capabilities including video display and capture capabilities, microphones, etc. The PC 500 is further connected to a printer 504 for generating hard copies of any data accessible by the computer.

10 In a preferred embodiment, the operating system utilized by the PC 500 is a windows-based operating system, preferably Windows 95.

15 In the preferred embodiment of the invention, each PC 500 is electronically linked to network server 508 via the Internet 518. Contained in each server 508 is a transaction server 510, meeting server 512, "inner circle" server 514, and "outer circle" server 516. The transaction server 510 is utilized to handle secure purchases via the store 78 (FIG. 9) or travel agency (FIG. 36) interfaces.

20 The secure meeting server 512 is dedicated to implementing the meeting room 96 and coffee shop functionalities discussed in reference to FIGS. 9, 14, and 15. The secure "inner circle" server 514 is dedicated to handle sensitive data, such as medical records.

Other servers may be added as needed. For instance, there may be a separate media server to handle the audio and video functionalities of the system.

25 Communication via the Internet 518 is achieved in the preferred embodiment of the invention through telephone lines by means of a high-speed modem 506 connected to the PC 500. Alternatively, satellites, television cable systems, and ISDN lines may be utilized to access the Internet 518. Standard TCP/IP is utilized as the protocol to communicate between the servers 508 and a PC 500 via the Internet 518.

30 The network server 508 may be located at a health plan payor facility with an independent third party that acts as an Internet Service Provider or elsewhere. The servers 510-516 have access to one or more relational databases 522 (such as SQL) that contain all the health plan data, including information input to the journal and schedule book information. For example, pertinent information from a patient's journal will be uploaded to the server and downloaded to the physician and case advisor. Information provided by the physician will also be uploaded to the same server. System data will be downloaded to the case advisor on a periodic basis for review.

35 All the information needed by a user of the system is located in the databases 522 or on CD-ROM and/or DVD distributed to the users on a periodic basis, or, as technology permits, via streaming audio and video. For instance, in the presently preferred embodiment, the video and audio clips available to a chairperson 114 for conducting meetings (FIG. 14), or

1 via the kitchen (FIGS. 21, 22), gym (FIG. 26), tranquility park (FIG. 29), and library (FIG. 32)  
interfaces is located on CD-ROM or DVD. However, with the emergence of ISDN, cable  
modem, XDSL, and direct satellite delivery, it is anticipated that the system will be capable of  
sending streaming video and audio over the network.

5 There are three levels of security implementation to help achieve secure transmission of  
data to and from the servers 510-516, as well as to ensure that only authorized users may access  
the databases 522. User security for patients, physicians/case advisors, and health plan payors  
is assured by a two tier (user id and password) system. An example of such log-on screen is  
shown in FIG. 36.

10 Furthermore, a "cookie"-based code is used to monitor when users log in and out, and  
to keep track of how each user uses the system. This will, for example, allow the system to keep  
attendance at group meetings. If a user has missed a group meeting, the case advisor would then  
be able to follow up with him or her about the absence.

15 Referring back to FIG. 59, a firewall 520 is also provided at the server level to protect  
confidentiality of health plan data. Furthermore, encryption is furnished to ensure that  
communication between servers 510-516 and PCs 500 is secure.

20 A network administrator 524, who may be the case administrator or an independent third  
party, is also attached to the server 508. The network administrator subscribes all users to the  
system except for clinical or wellness group participants. Physicians or case advisors are  
responsible for subscribing clinical or wellness members. The network administrator is also in  
charge of maintaining the system's databases 522.

25 In the preferred embodiment, the system is constructed using the C++ programming  
language in conjunction with SQL 6.5, Cold Fusion, commercially available from Alaire  
Company, Visual Basic, commercially available from Microsoft Corporation), and HTML.  
Active X and Java components may also be invoked to handle the multimedia functions of the  
system.

30 It will be understood that the foregoing is merely illustrative of the principles of the  
invention, and that various modifications can be made by those skilled in the art without  
departing from the spirit and scope of the invention as defined by the following claims. For  
example, the system can be programmed in any number of programming languages besides C++  
code to achieve the underlying principles of the present invention. The screens can be  
reformatted to change their appearance, and many different data sets can be used for various  
patients with different chronic diseases.

## 1 CLAIMS

1. A method for monitoring compliance with a therapeutic behavior modification program, the method comprising the steps of:

5 providing a therapeutic behavior modification program having a series of milestones for a patient;

inputting patient data at prescribed times; and

10 correlating the patient's data using a microprocessor with the milestones in the therapeutic behavior modification program to determine whether the patient is complying with the program.

2. The method of claim 1 further comprising the steps of grouping particular data using the microprocessor and linking the data to a remote computer.

15 3. The method of claim 1 further comprising the step of using the microprocessor to provide graphical screens for encouraging the patient to comply with the therapeutic behavior modification program.

20 4. A therapeutic behavior modification program, compliance monitoring and feedback system comprising:

means, comprising a relational database and a microprocessor coupled to the database, for developing a therapeutic behavior modification program having a series of milestones for an individual;

25 means for monitoring the individual's compliance with the program including:

means for prompting the individual to enter health-related data;

means for correlating the individual's entered data with the milestones in the behavior modification program and generating compliance data indicative of the individual's progress toward achievement of the program milestones;

30 means, accessible to the relational database and microprocessor, for motivating the individual to comply with the program comprising an integrated system of graphical system interfaces, the motivating means including:

means for enabling the individual to review the compliance data;

means for providing health information to the individual from a remote source;

35 an electronic calendar integrated with the behavior modification program for signaling the individual to take action pursuant to the behavior modification program wherein the calendar accesses the relational database and integrates requirements of the program with the individual's daily schedule;

1 an electronic journal for enabling the individual to enter personal health-related information;

an electronic meeting room for linking the individual to a plurality of other individuals having related behavior modification programs for facilitating group peer support sessions for compliance with the program; and

5 means for providing motivational media presentations to the individual for encouraging the individual to comply with the program; and

a graphical electronic navigator operable by the individual to control the microprocessor for accessing different parts of the system.

10 5. The system of claim 4 wherein the means for developing the therapeutic behavior modification program comprises:

means for inputting preliminary health information relating to the individual;

15 means for presenting a plurality of suggested behavior modification programs containing suggested milestones generated as a function of the preliminary health information;

means for selecting one of the suggested behavior modification programs and altering the milestones to generate the individual's behavior modification program; and

means for loading the behavior modification program into the relational database.

20 6. The system of claim 4 further comprising means for providing the motivational media presentations to the individuals in the electronic meeting room as part of the group support sessions, thereby facilitating interactive group discussion about the presentations.

25 7. The system of claim 4 further comprising means for enabling the individual to select an avatar to represent himself or herself in the electronic meeting room.

8. A method for assisting an individual to comply with a therapeutic behavior modification program, the method comprising the steps of:

30 providing the therapeutic behavior modification program having a series of milestones for the individual;

inputting health data relating to the individual at prescribed times;

correlating the individual's health data with the milestones in the behavior modification program using a relational database and generating compliance data indicative of whether the individual is complying with the program;

35 grouping particular compliance data using a microprocessor and linking the data to a remote computer; and



1           motivating the individual to comply with the behavior modification program by:  
          providing medical information to the individual relating to the program;  
          presenting the individual with the compliance data to allow the individual  
to personally monitor compliance with the program;  
5           signaling the individual to take action according to the program through an  
electronic interface integrated with the individual's daily schedule;  
          providing remotely accessible group support sessions and motivational  
media directed toward encouraging the individual to achieve the program milestones; and  
          enabling the individual to retrieve the medical information, compliance data,  
10          and scheduling signals, and participate in the group support sessions and view the  
.. motivational media through a graphical electronic interface.

9.       The method of claim 8 wherein the step of providing remotely accessible group  
support sessions and motivational media comprises presenting the motivational media during the  
15       group support sessions to facilitate interactive group discussion about the presentations.

10.      The method of claim 8 further comprising the step of selecting an avatar to  
represent the individual during the group support sessions.

20       11.   A method for assisting an individual to comply with a computer implemented  
behavior modification program, the method comprising the steps of:

          providing milestones in the behavior modification program to be achieved by the  
individual;

          monitoring the individual's compliance with the program by:

25           obtaining health-related data of the individual at prescribed times;

          comparing the health-related data with the milestones for generating  
compliance data indicative of whether the individual is complying with the program, and  
encouraging the individual to comply with the program if the compliance data indicates lack of  
compliance; and

30           comparing the health-related data against accepted medical protocols and  
alerting the individual's physician or case advisor when a health-risk is present;

          educating the individual electronically on health topics germane to the individual's  
condition and behavior modification program; and

          motivating the individual to comply with the behavior modification program by:

35           providing group support for the individual by electronically linking the  
individual to a plurality of other individuals having related behavior modification programs;

          providing a reward to the individual when certain of the milestones are  
reached;

1                   presenting the individual with the compliance data for enabling the  
individual to personally monitor compliance with the program;  
                  enabling the individual to enter comments germane to the behavior  
modification program in a computer-implemented journal; and  
5                   providing motivational multi-media presentations for encouraging the  
individual to comply with the program.

12.   The method of claim 11 wherein the step of obtaining the health-related data  
comprises the user providing the data through a computer-implemented journal.

13.   The method of claim 12 wherein portions of the data in the journal are accessible  
to a physician.

14.   The method of claim 11 wherein the step of obtaining the health-related data  
comprises a physician obtaining the data from office visits by the individual to the physician.

15.   The method of claim 11 wherein the step of educating comprises providing recipes,  
stress management strategies, and nutritional, dieting, and exercise information to the individual.

16.   The method of claim 15 wherein ingredients appearing on the recipes are  
downloaded automatically to an on-line shopping list.

17.   The method of claim 11 wherein the group support is provided by a computer-  
implemented meeting room wherein the individual and the plurality of other individuals  
participate in on-line group meetings. the meetings comprising:

                  a chairperson for monitoring discussions and triggering multi-media presentations;

and

                  a means of representing the individual and the plurality of other individuals in the  
group meetings.

18.   The method of claim 17 wherein a computer-implemented schedule book enables  
the individual to:

                  view a list of on-line group meetings;

                  sign-up for a particular group meeting from the list of group meetings; and

                  request automated reminders for reminding the individual of group meetings for  
which the individual has signed-up.

1           19. The method of claim 17 wherein the meetings further comprise a means for the individual for contacting the plurality of other individuals via telephone directly from the computer-implemented meeting room.

5           20. The method of claim 11 wherein the group support is provided by a computer-implemented mentoring area for mentoring and giving support to the individual by other more experienced individuals.

10           21. The method of claim 20 wherein no more than a predetermined number of the more experienced individuals may be present in the mentoring area at a single time with the individual.

15           22. The method of claim 11 wherein the group support is provided through electronic mail for facilitating communication with the physician, case advisor, or the plurality of other individuals having related behavior modification programs.

20           23. The method of claim 11 wherein the group support is provided through an electronic bulletin board wherein the individual posts messages and read messages posted by the other individuals having related behavior modification programs.

25           24. The method of claim 11 wherein the reward is rewards points for being redeemed for goods, frequent flier miles, or a symbolic reward commending the individual for good work.

30           25. A therapeutic behavior modification program, compliance monitoring and feedback system comprising:

                  means, comprising a relational database and a microprocessor coupled to the database, for developing a therapeutic behavior modification program having a series of milestones for an individual;

                  means for subscribing an individual to the behavior modification program;

                  means for monitoring the individual's compliance with the program including:

                            means for obtaining health-related data of the individual at prescribed times for input into a relational database;

                            means for comparing the health-related data with the milestones in the behavior modification program for generating compliance data indicative of whether the individual is complying with the program, and encouraging the individual to comply with the program if the compliance data indicates lack of compliance; and

                            means for comparing the health-related data against accepted medical protocols and alerting the individual's physician or case advisor when a health-risk is present;

1 means for educating the individual electronically on health and medical topics  
germane to the individual's condition and behavior modification program;

means, accessible to the relational database and microprocessor, for motivating the  
individual to comply with the program including:

5 means for providing group support for the individual by electronically  
linking the individual to a plurality of other individuals having related behavior modification  
programs;

means for providing a reward to the individual when certain of the  
milestones are reached;

10 means for presenting the individual with the compliance data for enabling  
the individual to personally monitor compliance with the program;

means for enabling the individual to enter personal feelings and comments  
germaine to the behavior modification program into a computer-implemented journal; and

15 means for providing motivational multi-media presentations for encouraging  
the individual to comply with the program;

means for modifying the program based on the individual's progress; and

a graphical user interface for controlling the microprocessor for accessing different  
parts of the system.

20 26. The system of claim 25 wherein the means for developing the therapeutic behavior  
modification program comprises:

means for inputting preliminary health information relating to the individual;

25 means for presenting a suggested behavior modification program containing  
suggested milestones generated as a function of the preliminary health information and accepted  
medical protocols;

means for modifying the suggested behavior modification program to generate the  
individual's behavior modification program;

means for loading the behavior modification program into the relational database;  
and

30 means for giving access to the individual to the graphical user interface for  
controlling the microprocessor for accessing different parts of the system.

27. The system of claim 25 wherein the means for obtaining the health-related data  
comprises means of prompting the individual to input health-related information into a  
35 computer-implemented journal.

1           28.    The system of claim 25 wherein the means of educating comprises means for providing recipes, stress management strategies, and nutritional, dieting, and exercise information to the individual.

5           29.    The system of claim 28 wherein the means for providing recipes includes means for downloading recipe ingredients to a computer-implemented shopping list.

          30.    The system of claim 25 wherein the means for providing group support comprises means for providing on-line group meetings comprising:

              means for electronically viewing a list of group meetings available for  
              ation;

              means for electronically registering for a particular group meeting;

              means for sending automated reminders for reminding the individual about the particular group meeting for which the individual is registered;

15            means for providing an electronic meeting room for the group meetings;

              means for monitoring discussion during the group meetings;

              means for triggering multi-media presentations during the group meetings;

              means for electronically representing the individual and the plurality of other individuals in the group meetings; and

20            means for contacting the plurality of other individuals via a telephone directly from the computer-implemented meeting room.

          31.    The system of claim 25 wherein the means for providing group support comprises a means for providing a computer-implemented mentoring area for mentoring and giving support  
25            to the individual by other more experienced individuals.

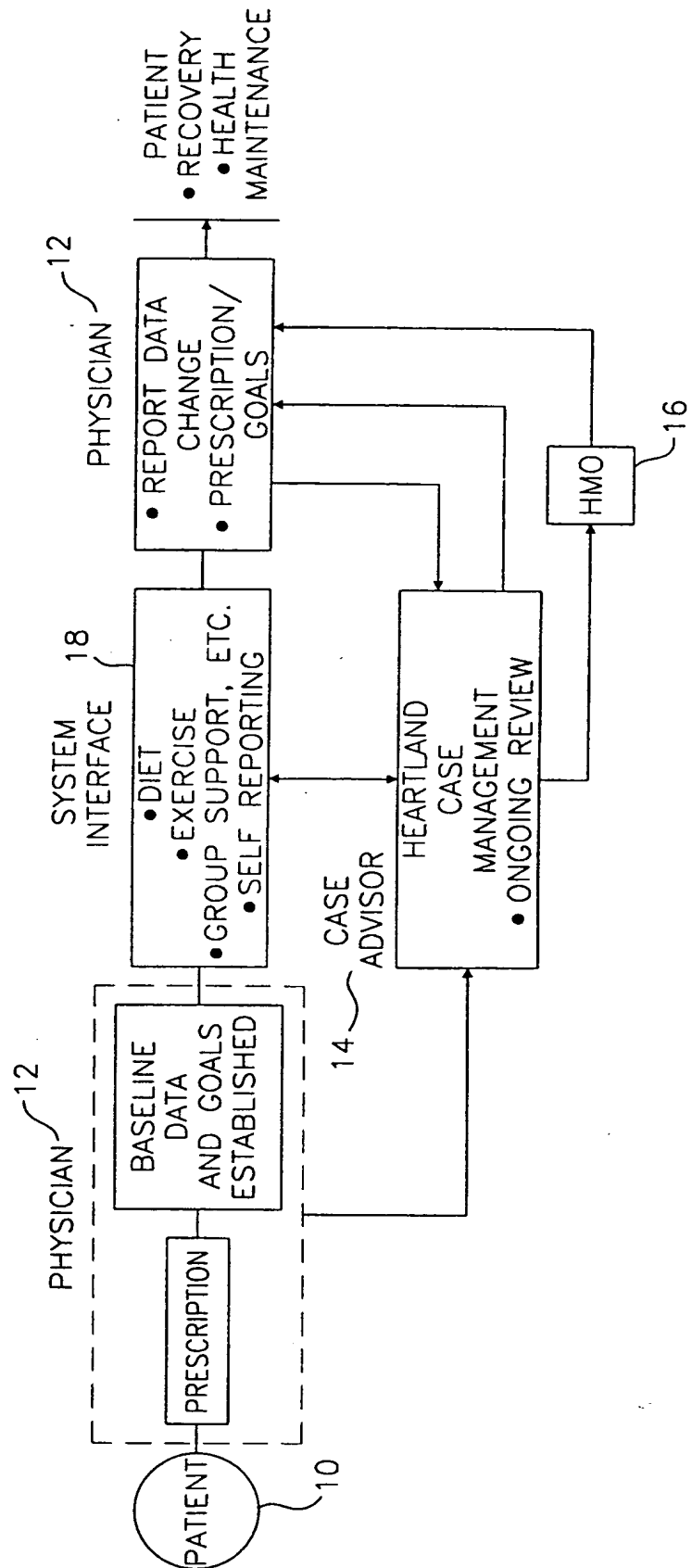
          32.    The system of claim 25 wherein the means for providing group support comprises electronic mail means for facilitating communication with the plurality of other individuals.

30           33.    The system of claim 25 wherein the means for providing group support comprises electronic bulletin board means for posting messages and reading messages posted by the other individuals having related behavior modification programs.

35           34.    The system of claim 25 further comprising a means for providing security from unauthorized access to the system.

          35.    The system of claim 25 further comprising a means for health plan payors for monitoring usage of the system.

FIG. 1



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*Fig. 2*

*22* HeartLand Prescription Form

*23*

Patient Name	Patient ID	Date	Physician Name	Physician ID

## 1. Fill in diagnosis:

Patient Diagnosis	Co-morbid Diagnosis

## 2. Circle a diagnostic category:

*24* *20* *20*

Category	Diagnosis	Level 1 (mos.)	Level 2 (mos.)	Level 3 (mos.)	Health and Wellness
I	Current year MI survivor	3	3	6	Contin.>12th month
II	Current year alt. to PTCA or CABG	3	3	6	Contin.>12th month
III	Current year diagnosed CAD	3	3	6	Contin.>12th month
IV	All diagnosed Angina	3	3	6	Contin.>12th month
V	Prior years' post MI/surgical--High Risk	3	3	6	Contin.>12th month
VI	Prior years' post MI/surgical--Low Risk	1	1	10	Contin.>12th month
VII	2 or more Risk factors	0	2	4	Contin.>12th month
VIII	Health and Wellness	0	0	0	Continuous

## 3. Please circle as appropriate:

- 30 { Does the patient need smoking cessation? Yes No  
 Have you prescribed nicotine patch or gum? Yes No  
 32 { Does the patient need weight reduction? Yes No If yes, target weight: \_\_\_\_

## 4. What are patient's current and prescribed medications?

Medication	Standard Dosage	Comments/Changes
HCTZ	25 mg	
Atenolol	50 mg	
Lisinopril	20 mg	
Atorvastatin	20 mg	
Antioxidant: Vitamin E	400 IU	
Antioxidant: Vitamin C	500 mg	
Other:		
Other:		
Other:		
Other:		

## 5. Circle or fill in desired 3-month targets:

Daily Calories	1200	1500	2000	2500	3000
Sat Fat Grams	<15	15	18	20	25
Pct Fat Cal	10%	15%	20%	25%	30%
Exercise (Freq/wk/RPE)	20/5x/3	30/5x/4	45/5x/5	50/5x/6	60/5x/7
Max Heart Rate					
Stress Reduction Needs	Low Need	Some	Definite	High	Very High
Lipid Level Target					
Total Cholesterol	140	150	175	200	<225
LDL	60	70	80	<100	<125
HDL	35	37	39	41	>42

Physician's Signature: \_\_\_\_\_

Telephone: \_\_\_\_\_

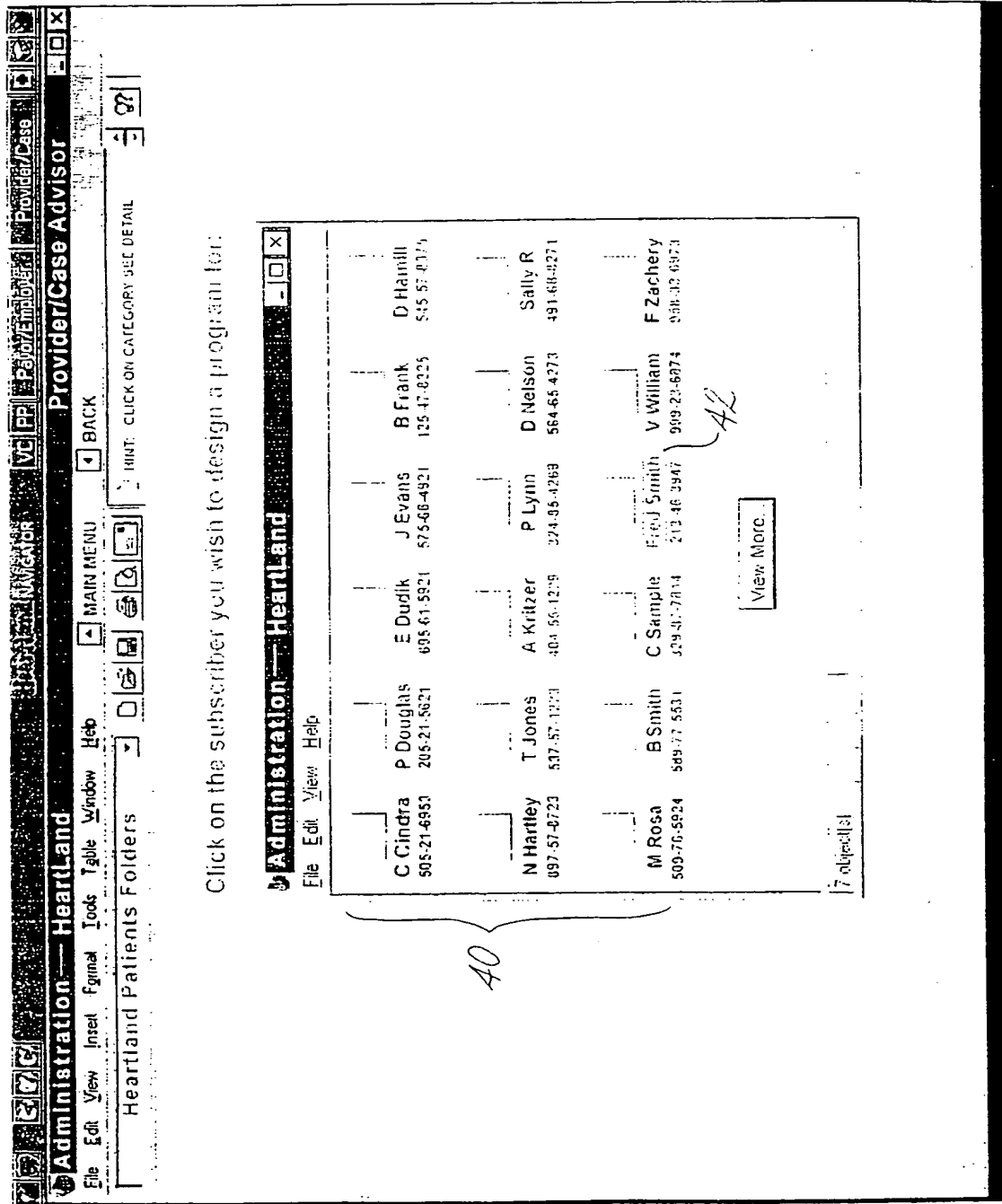
FAX THIS FORM TO SALUS MEDIA: (805) 969-3601

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SUBSTITUTE SHEET (RULE 26)

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Fig. 3





Administration — HeartLand				Provider/Case Advisor			
File	Edit	View	Format	Tools	Table	Window	Help
HeartLand Health Assessment Review				CLICK ON CATEGORY SEE DETAIL			
SCREEN 1 OF 3							
PATIENT STATUS & GOALS DETAILS				GOALS			
Name / D.O.B.	Fred Smith	2-5-49		New 2/10/98	1 month Goal		
Starting Date	2/1/98						
Heartland I.D.	23-642						
Height / Sex	5'9"	Male					
Weight	193			192			
BMI	28.28			28.28			
Smoke	.5	Packs/Day		.5			
Physical Activity	0/0/0	minutes / x-week / RPE		20 / 3 / 3			
Alcohol	2	Average Drinks per Day		2			
Eating Habits	40	% Fiber/Complex Carb Intake		60			
	40	% Fatty Food Intake		20			
	40	% Fatty Dairy Intake		20			
Calories	3,600			3,300			
Fat Calories & %	45%			1,500			
Cholesterol - LDL	142			140 mg/dl			
Cholesterol - HDL	35			37 mg/dl			
Cholesterol	246	mg/dl		225			
Resting Pulse Rate	98	Beats Per Minute		88			
Stress	9.5	Scale of 1 to 10 (10 being highest stress)		7.0			
Depression	Scale of 1 to 10 (10 being greatest)			10			
Blood Pressure	140/100	systolic/diastolic		140/100			
Scatbell Use	30	percent of time		50			
Back Pain	Incidents per month			3			
Thrombotic activity							
- aspirin	325	mg		325 mg/day			
- hydrochlorothiazide	12.5	mg		12.5 mg/day			
- Lovastatin	20	mg		20 mg/day			

Fig. 5

**Administration — Heartland**  
 File Edit View Insert Format Tools Table Window Help  
 Heartland Health Assessment Review

**Provider/Case Advisor**  
 BACK PREVIEW / EDIT PATIENT PROGRAM  
 HIRE: CLICK BOX TO DESIGN PROGRAM

SCREEN 2 OF 3  
 Design a new program for: **Fred Smith** Date: **3/10/98**  
 Heartland I.D. #: **23-642** Social Security #: **213-10-3947**

INITIAL SCALE  
 LOW INTENSITY HIGH

	LOW	INTENSITY	HIGH
DIET	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EXERCISE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
STRESS MANAGEMENT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GROUP SUPPORT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DRUG	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Based on your input, Heartland suggests the following program and goals for: **Fred Smith**

	15%	Calories From Fat
Diet	3/4	hr
Exercise	4	days per week
Stress Management	1/2	hr
Group Support	1/2	days per week
Compliance Mgt. Freq.	5	hr
Smoking	4	days per week
		times per Month
		Cessation
Drug - aspirin	325	
Drug -hydrochlorothzid.	12.5	mg/da
Drug -Lovastatin	20	

Program Detail

Based on your input, Heartland suggests the following program and goals for: **Fred Smith**

## Program Detail

Administration — HeartLand						Provider/Case Advisor	
File	Edit	View	Insert	Format	Tools	Table	Window
HeartLand Health Assessment Review						MAIN MENU	
						BACK	
SCREEN 3 OF 3							
Based on your Input, here is HeartLand's recommended program for: Fred Smith							
Use the buttons to confirm or edit this program.							
<div style="float: right;"> <div>CONFIRM</div> <div>EDIT</div> <div>OPTIONS...</div> </div>							
PATIENT STATUS & GOALS: DETAILS							
Name / D.O.B.	Fred Smith	2-5-49					
Starting Date	2/1/98						
Heartland I.D.	23-642						
Height / Sex	6'9"	Male					
Weight	193						
BMI	28.28						
Smoke	5	Packs/Day					
Physical Activity	0 10 10	minutes / x-week / RPE					
Alcohol	2	Average Drinks per Day					
Eating Habits	40	%Fiber/Complex Carb Intake					
	40	%Fatty Food Intake					
	40	%Fatty Dairy Intake					
Calories	3,600						
Fat Calories & %	45%						
Cholesterol - LDL	132						
Cholesterol - HDL	35						
Cholesterol	246	mg/dl					
Resting Pulse Rate	88	Beats Per Minute					
	6.5	Scale of 1 to 10 (10 being high stress)					
		Scale of 1 to 10 (10 being greatest)					
Blood Pressure	140/100	systolic/diastolic					
Seatbelt Use	30	percent of time					
Back Pain		Incidents per month					
Pharmaceuticals							
- aspirin	325	mg					
- hydrochlorothiazide	12.5	mg					
- Lovastatin	20	mg					

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*Fig. 7*

## HeartLand Patient Progress Report

Date: April 2, 1997

Dear Doctor Cavello:

This is a status report on your patient, Fred Smith, SSN: 565-76-2334, Plan No. 011-066754

Your diagnosis was: **non-complicated anterior MI** and co-morbid diagnosis **none**.Patient entered the HeartLand program on **March 12, 1997**. He/she has been on the program 3 weeks.

Progress toward goals:

Parameter	Current Status <sup>66</sup>	Suggested Next Steps <sup>67</sup>	Target <sup>68</sup>
Blood Pressure	146/92	144/90	140/90
Weight	172	170	170
Resting Pulse	67	65	65
Exercise Program	35 min/4x-wk/4 RPE	45 min/4x-wk/5 RPE	45 min/6x-wk/6 RPE
Total Cholesterol	210 mg/dl	200 mg/dl	190 mg/dl
LDL Cholesterol	125mg/dl	115mg/dl	100mg/dl
HDL Cholesterol	39mg/dl	42mg/dl	45mg/dl
Diet: Cal/day	3100	3000	2800
Sat Fat grams/day	20 g	15 g	10 g
Smoking Status	0 was: .5 pack/day	0	0
Aspirin	325 mg - missed 1/wk	325 mg - missed 0/wk	325 mg - missed 0/wk
HCTZ	12.5 mg. - missed 0/wk	1205 mg. - missed 0/wk	12.5 mg. - missed 0/wk
Lovastatin	20 mg. - missed 0/wk.	20 mg. - missed 0/wk.	20 mg. - missed 0/wk.
Other			
Other			
Other			

Please initial here to indicate you have reviewed this Status Report: \_\_\_\_\_

Please initial here to indicate you agree with suggested next step targets: \_\_\_\_\_

Indicate any changes desired in Next Step Goals and Medications:

---



---

Physician's Signature: \_\_\_\_\_

Thank you,

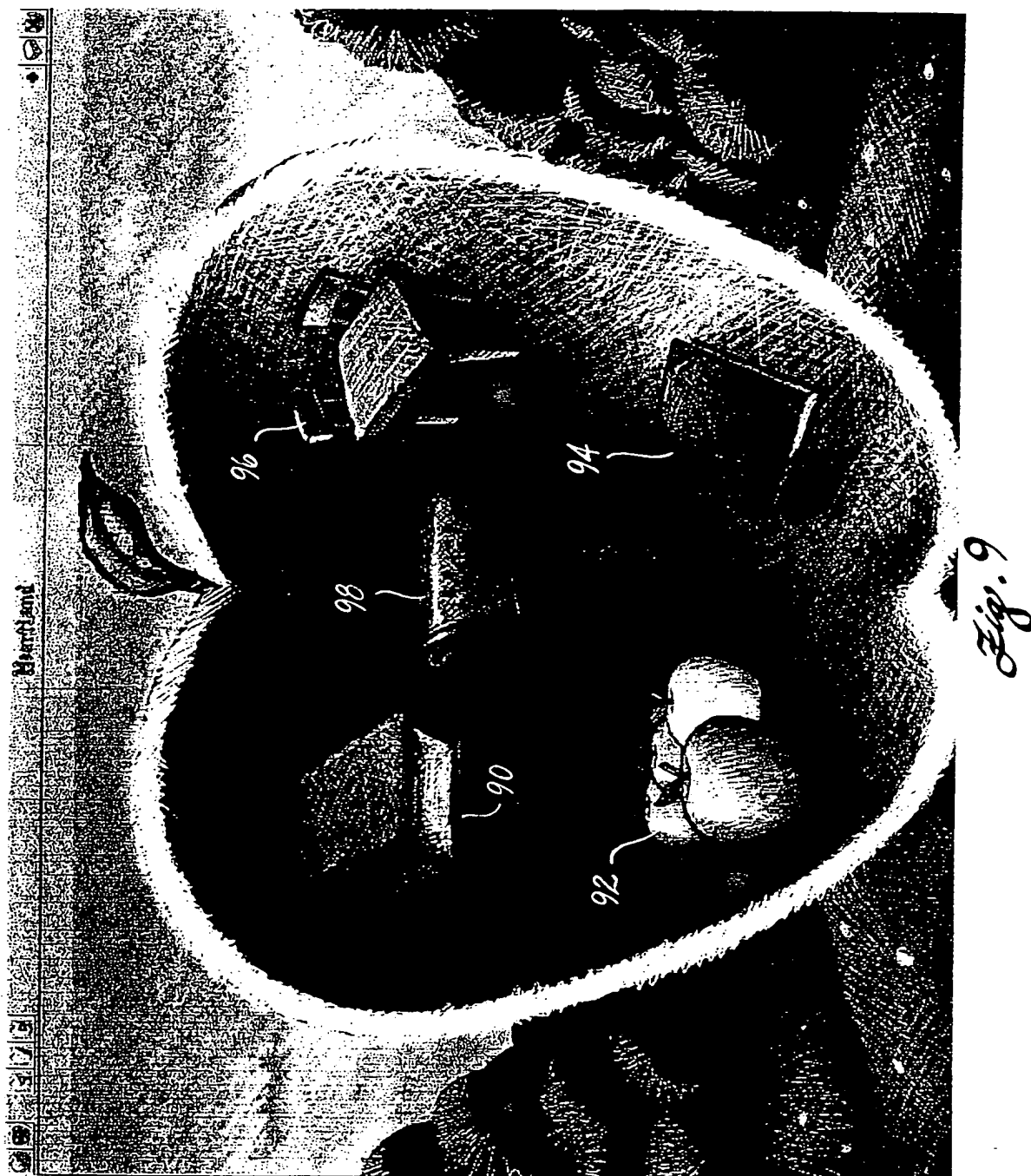
Mary Quinn  
HeartLand Case Advisor

FAX THIS FORM TO SALUS MEDIA: FAX NO. (805) 969-3601

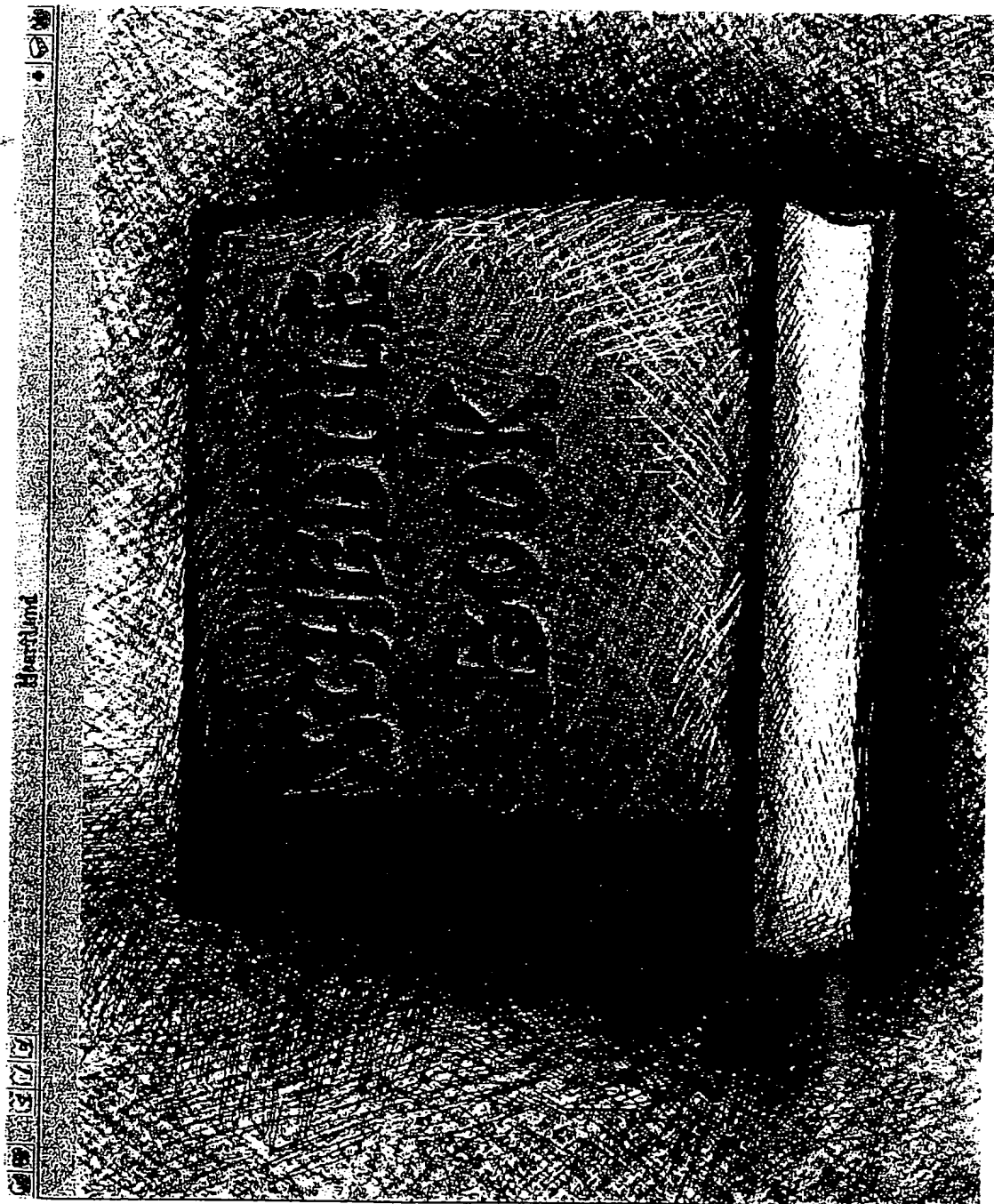
You will receive Fax confirmation within 24 Hours. For Assistance please call (805) 969-2234

SUBSTITUTE SHEET (RULE 26)

*Fig. 8*



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*Fig. 10* 90A

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100

106

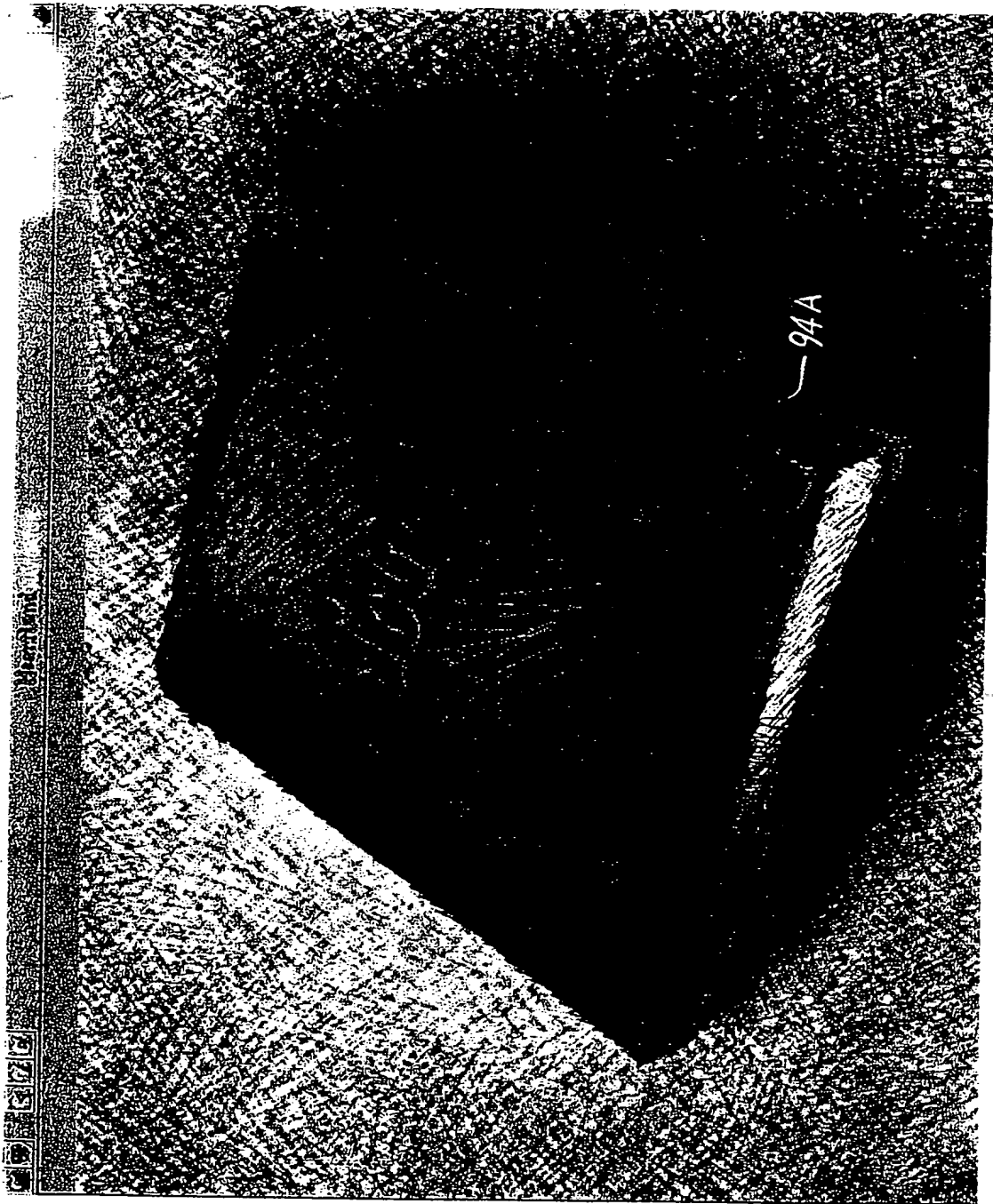
108

TIME	GROUP	#	CITY	ACTIVITY
7:30 A.M.	Movies	4	LA, CA	Low
7:30 A.M.	Dog Lovers	15	LA, CA	High
7:30 A.M.	Purr-fectly Right	18	NYC, NY	High
7:45 A.M.	Just for Laughs	10	NYC, NY	Med.
8:00 A.M.	Spartans	12	Chicago, IL	Med.
7:30 A.M.	Travelers	5	LA, CA	Low
7:45 A.M.	Cool Set	8	LA, CA	Low
7:45 A.M.	Country Bunkers	12	Itasca, NY	Med.
7:30 A.M.	City Slickers	8	NYC, NY	Low
7:45 A.M.	K9's	18	NYC, NY	High
8:00 A.M.	Water Babies	7	Dallas, TX	Med.
104				

Fig. 11



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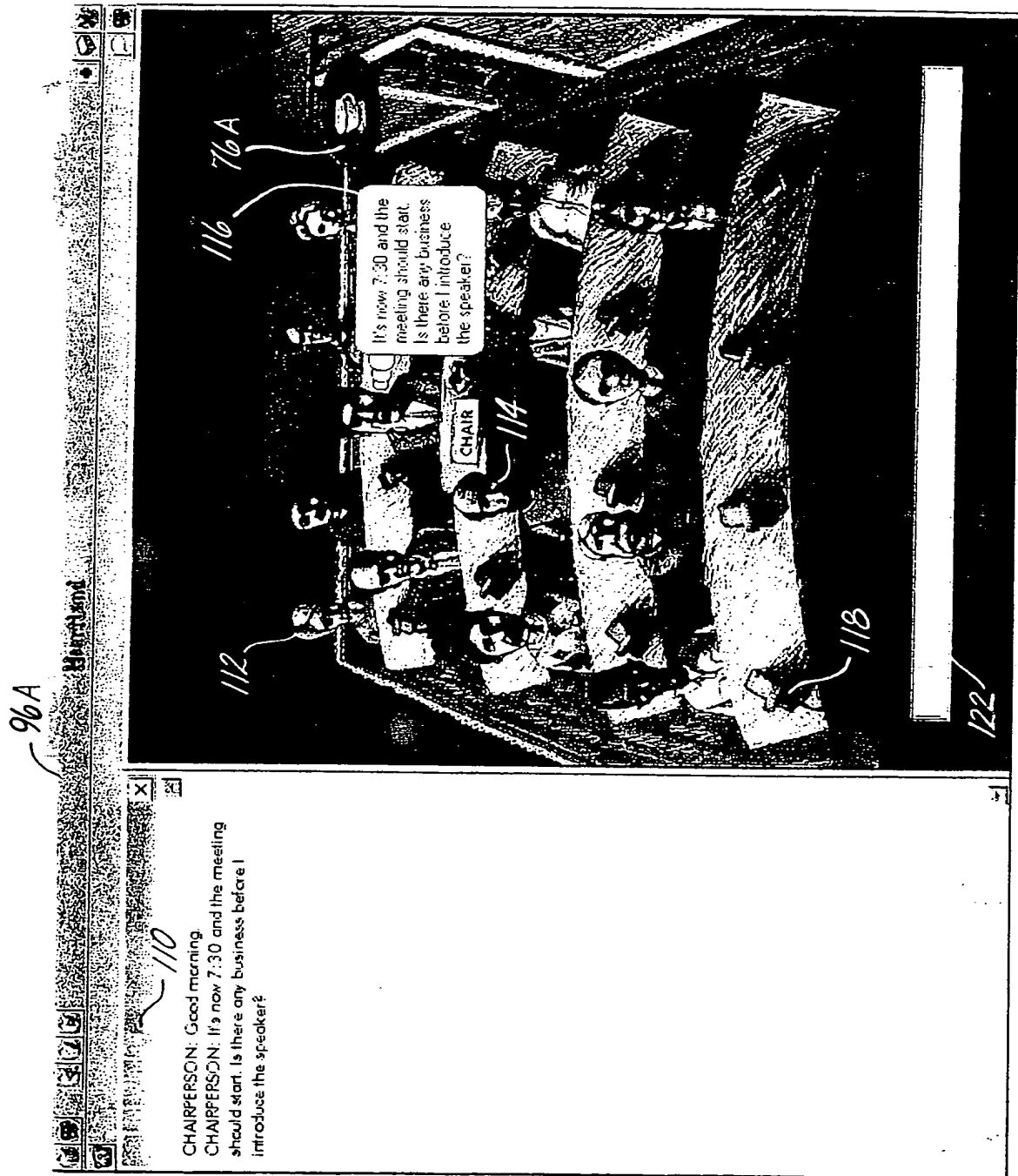
*Fig. 12*

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EMOTICONS ~100		VITAL SIGNS ~102		EXERCISE ~104	
Happy	<input type="checkbox"/>	Heart Rate	82	Walking	<input type="checkbox"/>
Comprehending	<input type="checkbox"/>	Blood Pressure	160/98	Stretching	<input checked="" type="checkbox"/>
more confident	<input type="checkbox"/>	Cholesterol	230	Stress Mgmt.	<input type="checkbox"/>
confident	<input type="checkbox"/>	Diet	<input type="checkbox"/>		
committed	<input type="checkbox"/>		<input type="checkbox"/>		
Worried	<input checked="" type="checkbox"/>		<input type="checkbox"/>		
anxious	<input type="checkbox"/>		<input type="checkbox"/>		
scared	<input type="checkbox"/>		<input type="checkbox"/>		
Aware	<input type="checkbox"/>		<input type="checkbox"/>		
Growing	<input type="checkbox"/>		<input type="checkbox"/>		
Falling	<input type="checkbox"/>		<input type="checkbox"/>		
Drifting	<input type="checkbox"/>		<input type="checkbox"/>		
Angry	<input type="checkbox"/>		<input type="checkbox"/>		
Sad	<input type="checkbox"/>		<input type="checkbox"/>		
Depressed	<input type="checkbox"/>		<input type="checkbox"/>		

Fig. 13

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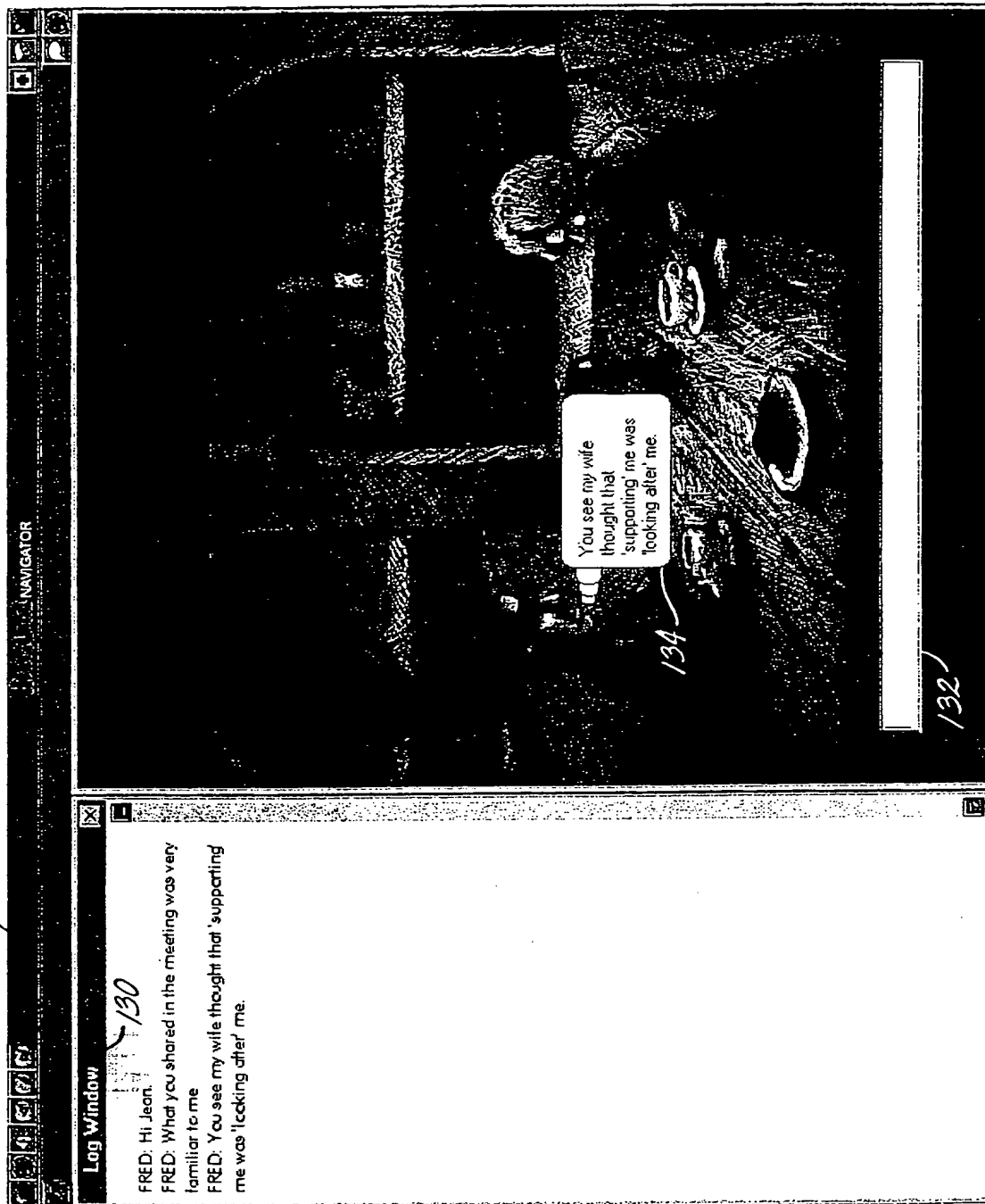
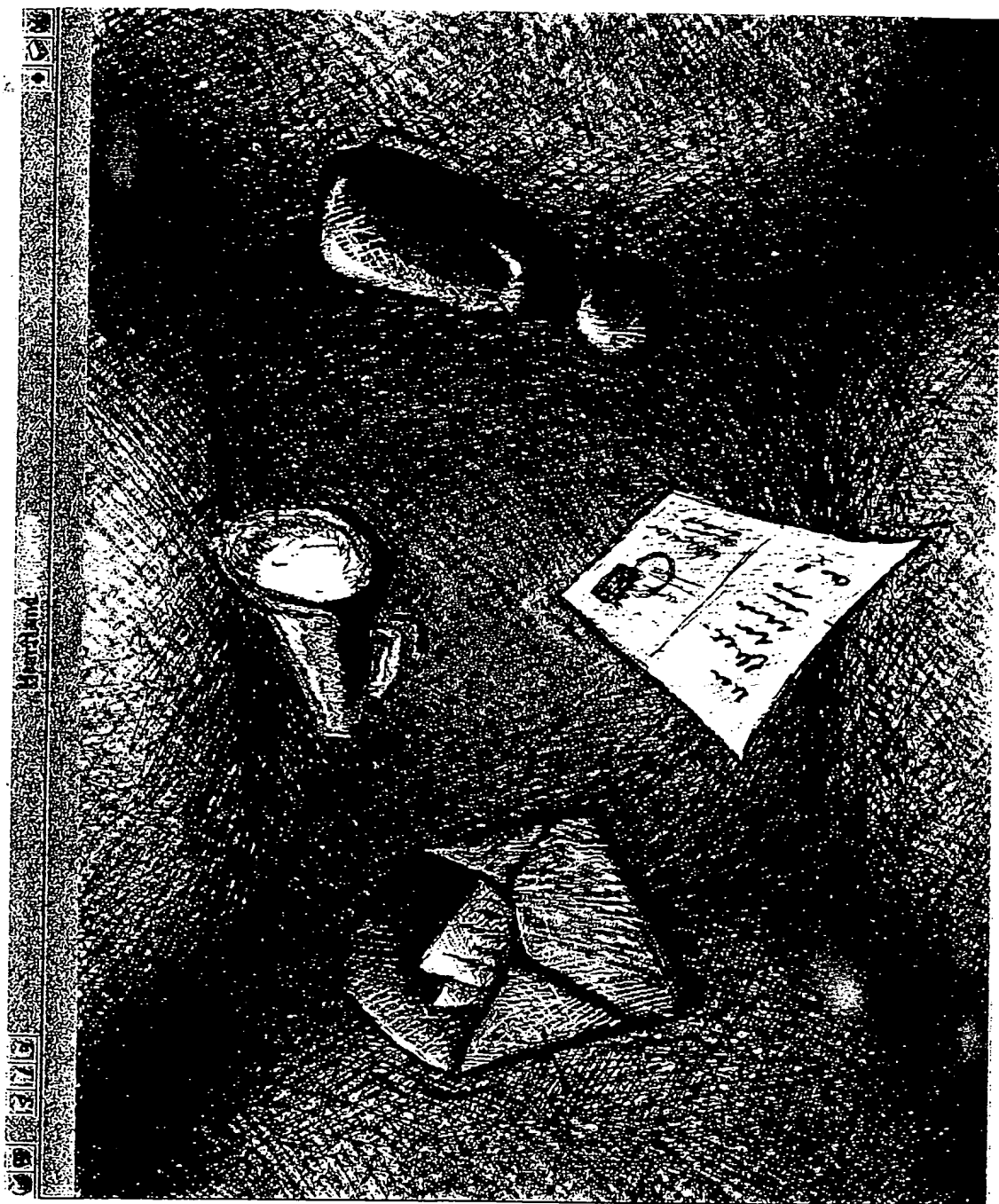
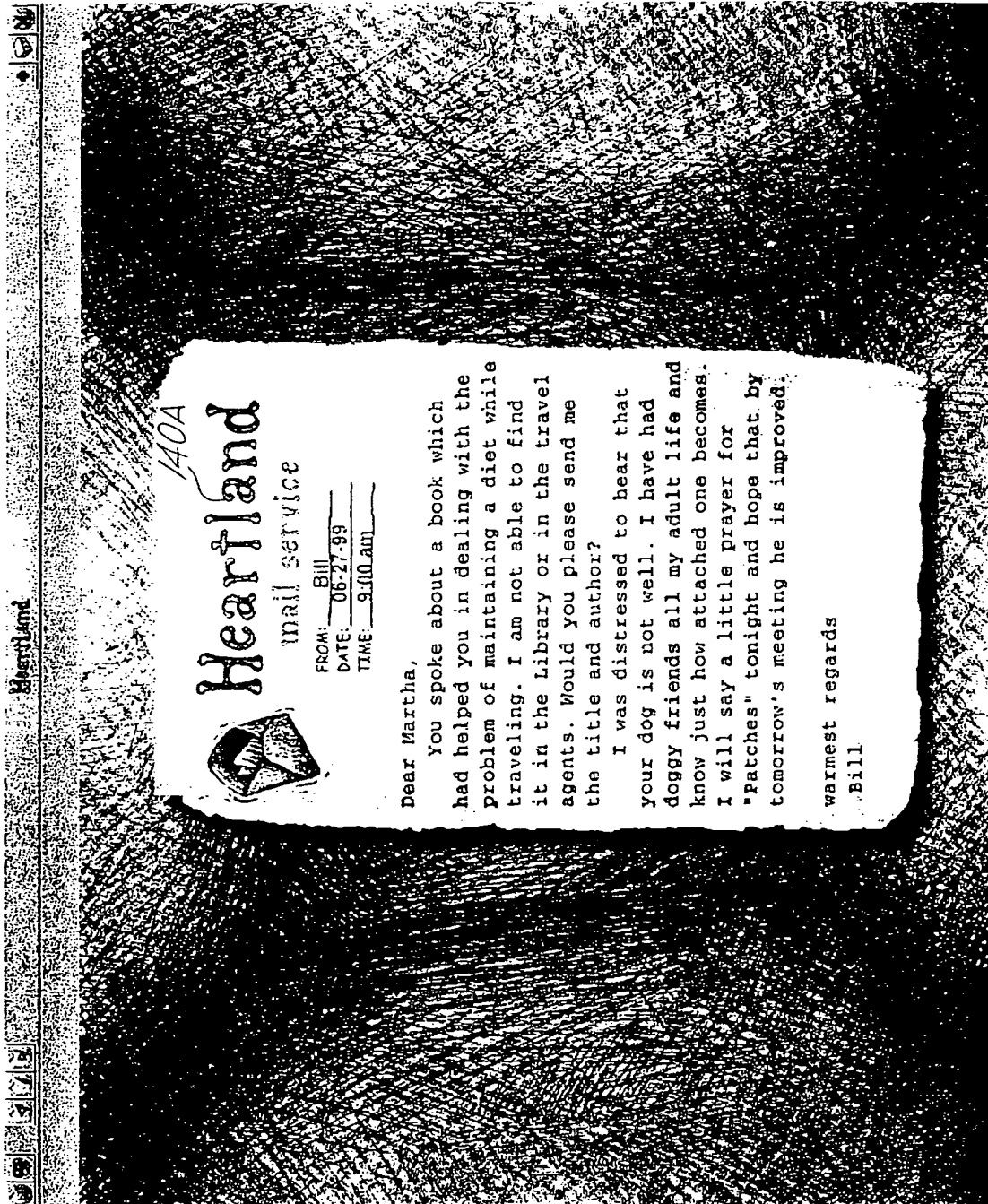


Fig. 15

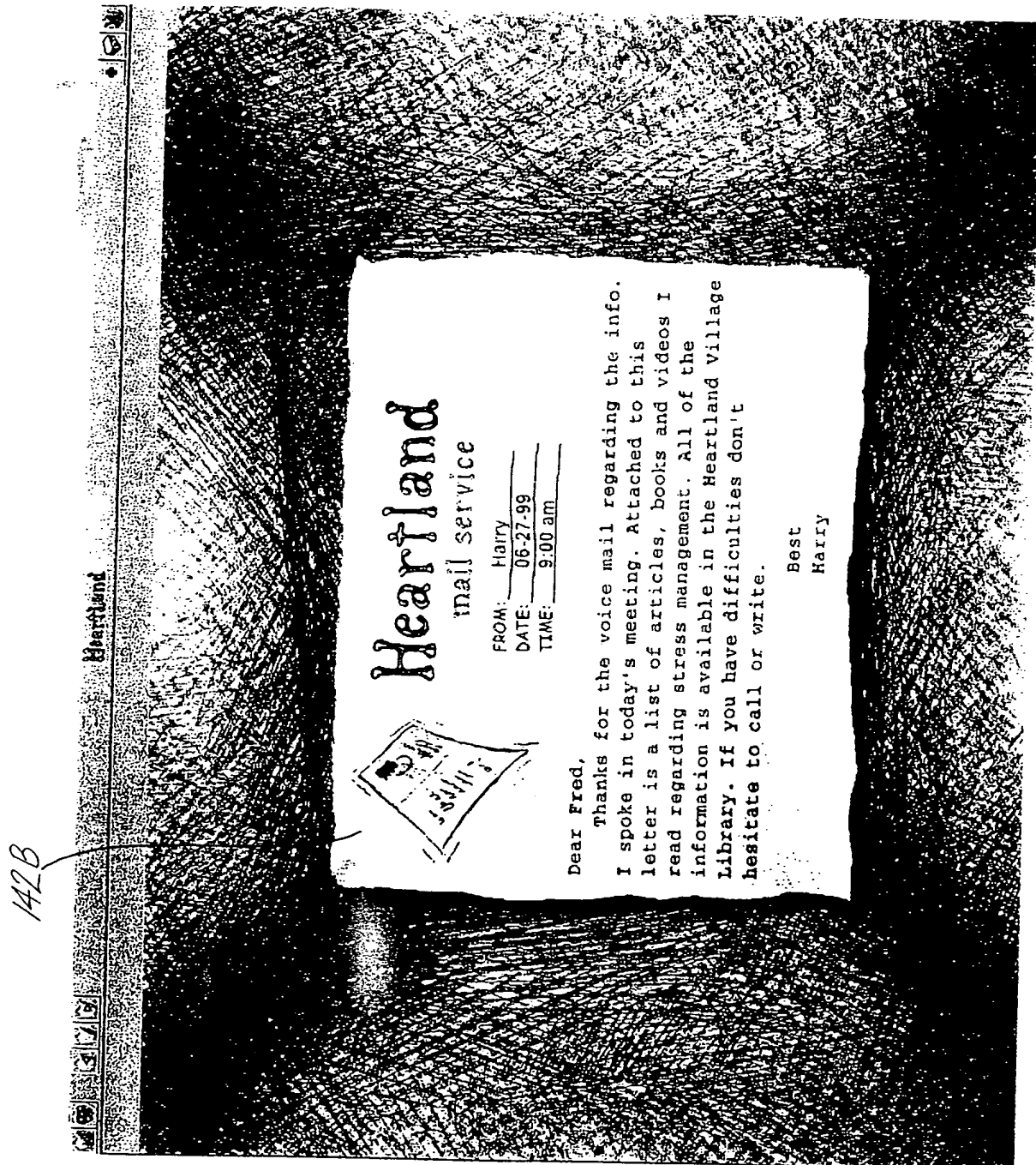


*Fig. 16*

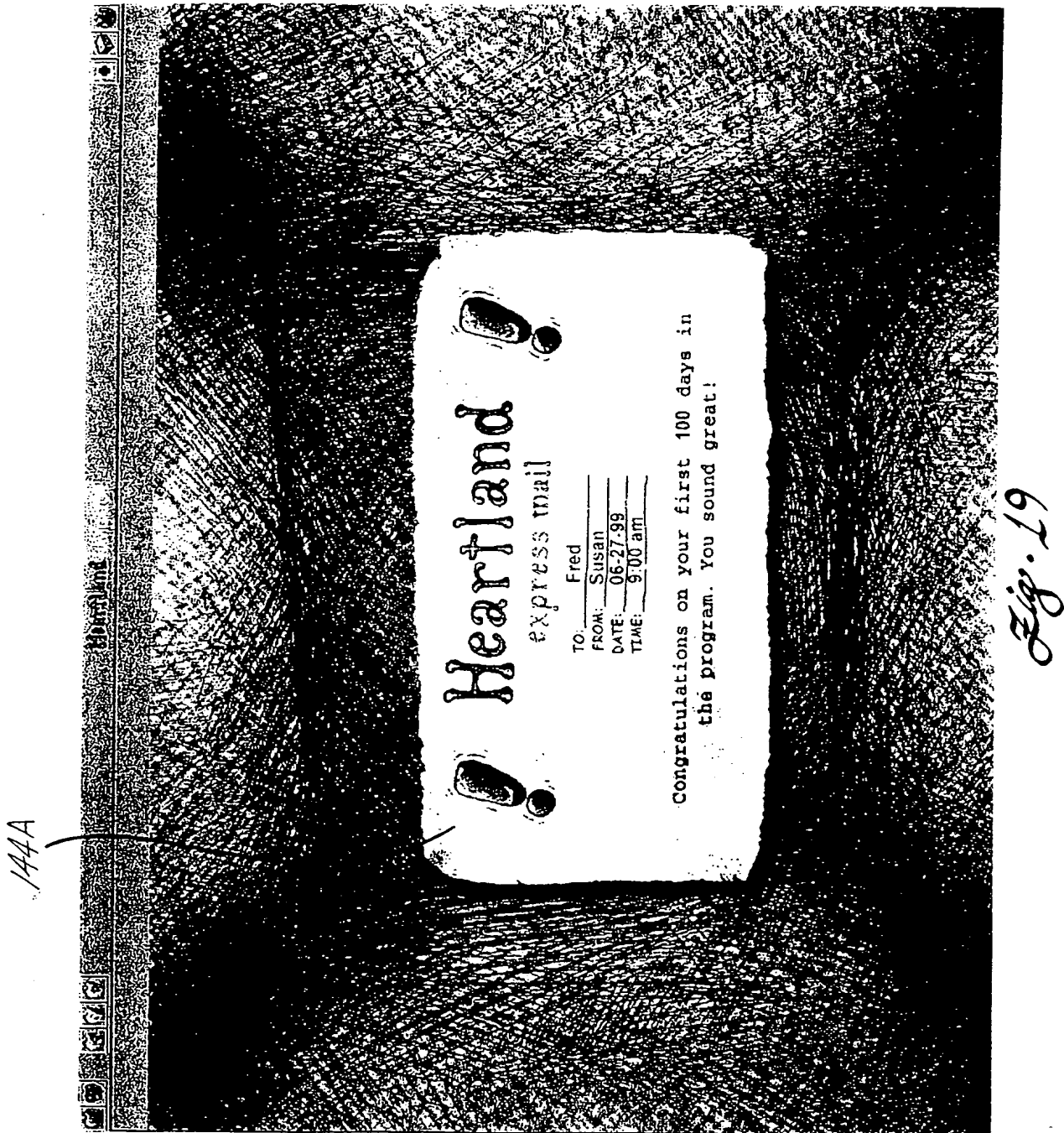
17/60

*Fig. 17*

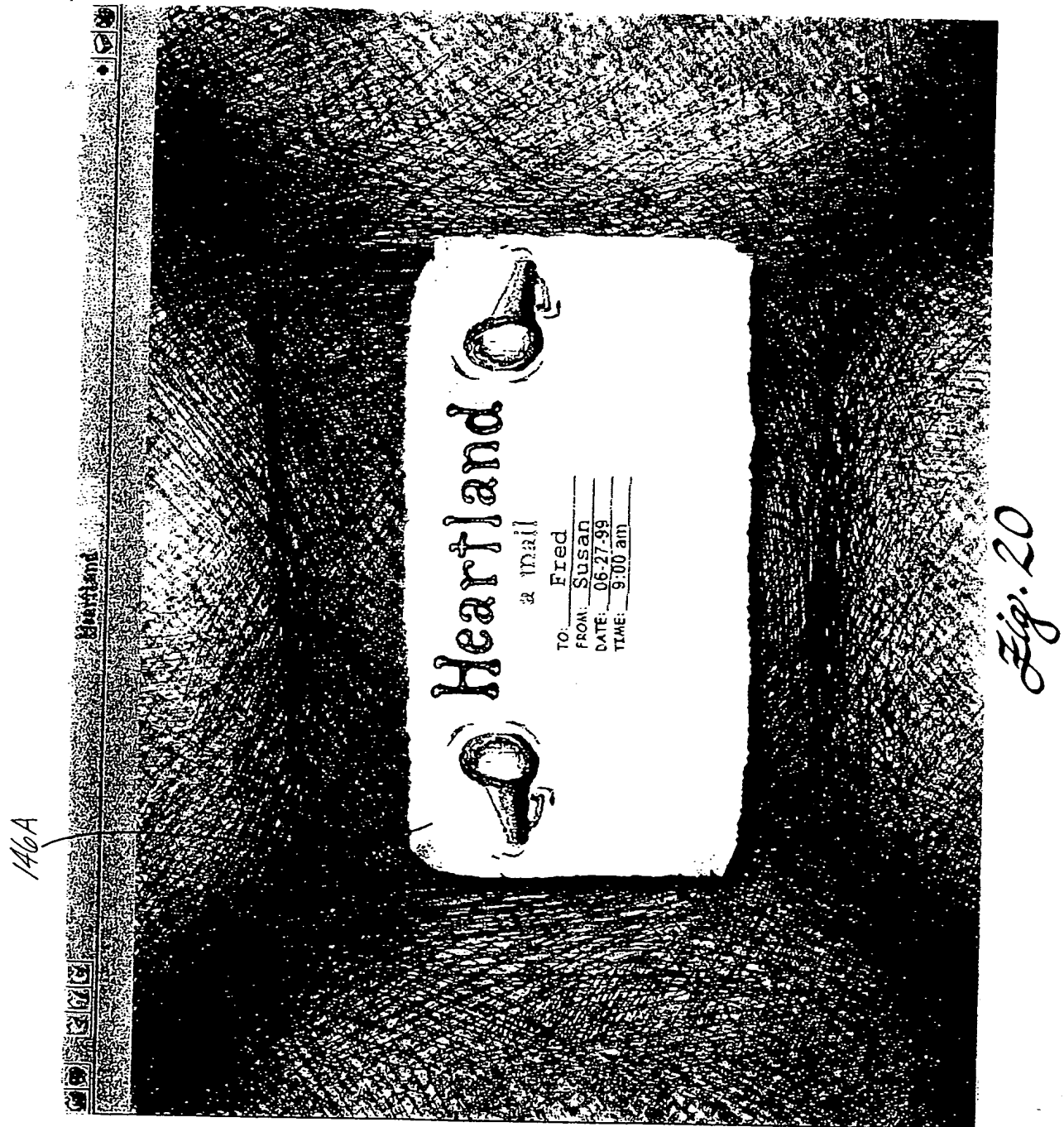
18/60

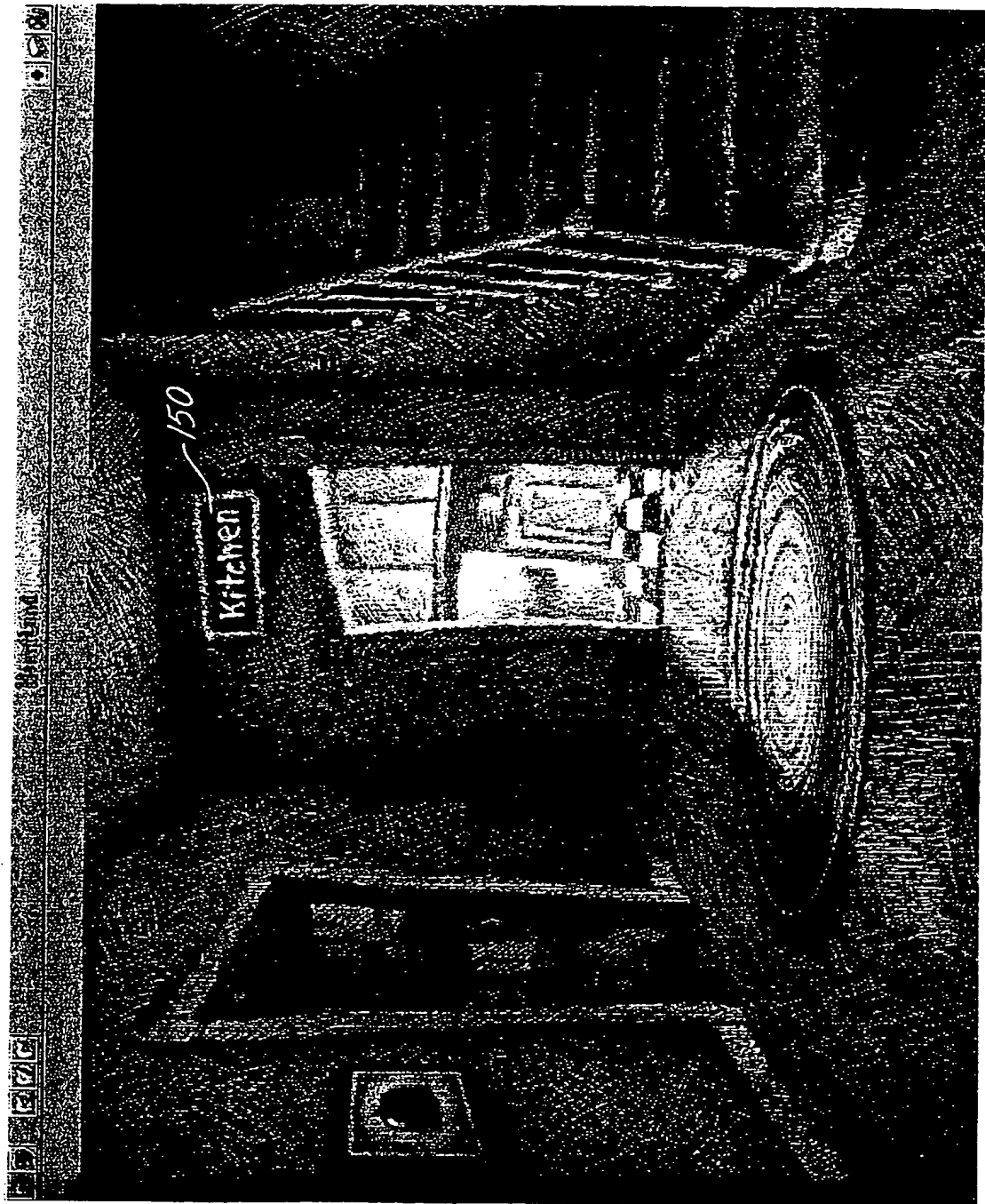


19/60

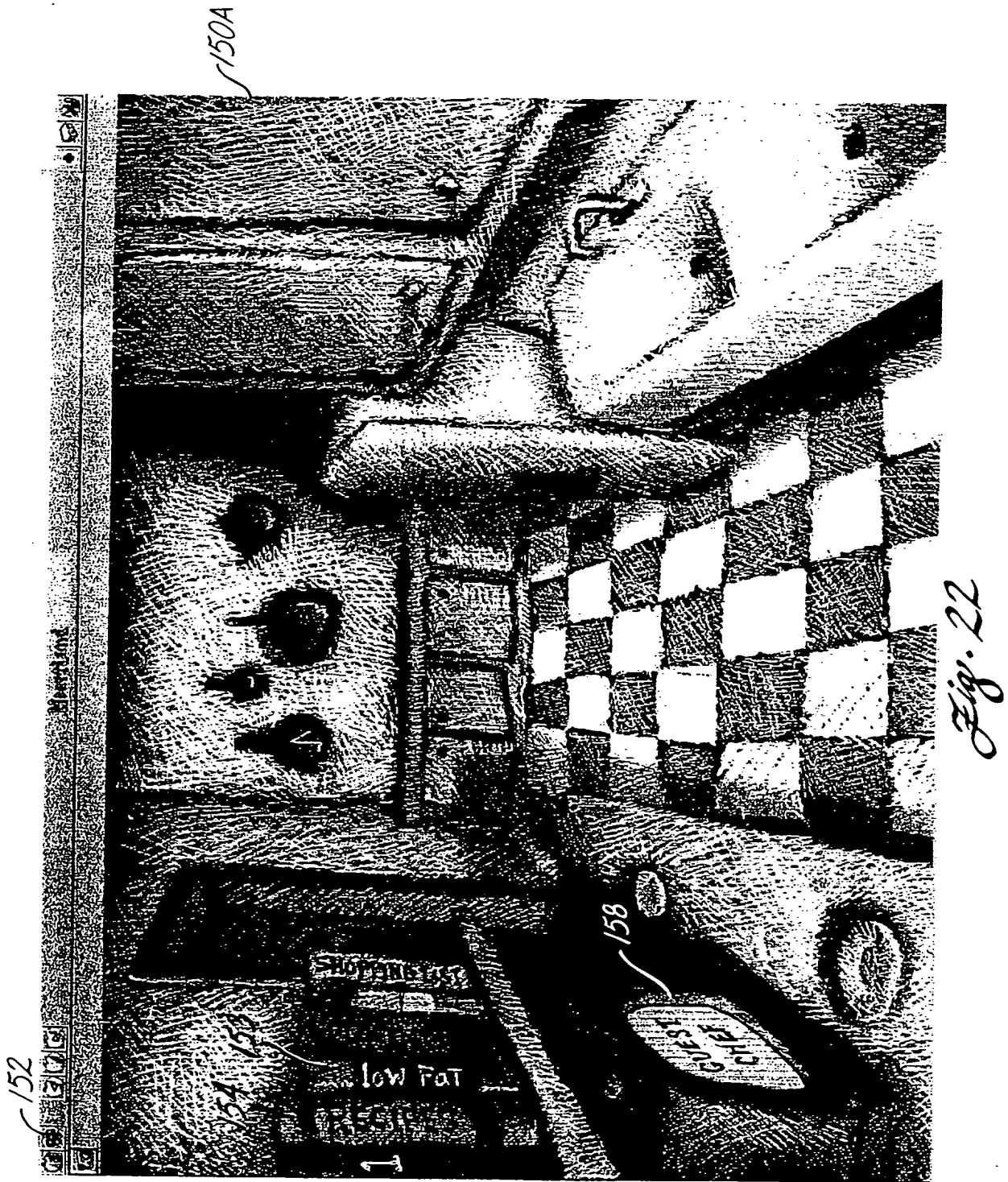








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**Green Pepper-Corn Frittata**

**Ingredients:**

- 1/4 teaspoon dried oregano
- 2 eggs
- 4 egg whites
- 1/4 cup (2 fl oz/60 ml) nonfat milk
- 1/4 teaspoon salt
- 1/4 teaspoon ground black pepper
- 1/4 teaspoon ground mustard
- 1 tablespoon grated Romano cheese
- 1/4 cup (2 fl oz/60 ml) chopped green pepper (capsicum)
- 1/4 cup (2 fl oz/60 ml) corn kernels

**Preparation:** 20 minutes • **Cooking:** 30 minutes • **Serves:** 4

Green peppers and corn are excellent sources of vitamin A, and peppers are rich in the antioxidant vitamin C as well. Both vegetables are in season from late spring through early autumn, giving you plenty of opportunity to make this quick meal over and over again.

Preheat an oven to 350°F (180°C). In a large ovenproof frying pan over medium heat, heat the olive oil. Add the onion and green pepper and cook until tender, about 5 minutes. Add the tomatoes, corn and oregano and cook for 5 minutes. Transfer the vegetables into a medium bowl.

In a large bowl, combine the eggs, egg whites, milk, salt, pepper and mustard and whisk until blended. Add the egg mixture to the vegetable mixture.

In the same frying pan over low heat, pour in the egg-vegetable mixture. Cook, stirring frequently, until the eggs are firm on the bottom and almost set on the top, 8-10 minutes. Sprinkle the cheese on top and bake in the oven until the eggs are set, 5-8 minutes.

To serve, cut into 4 wedges and divide among individual plates.

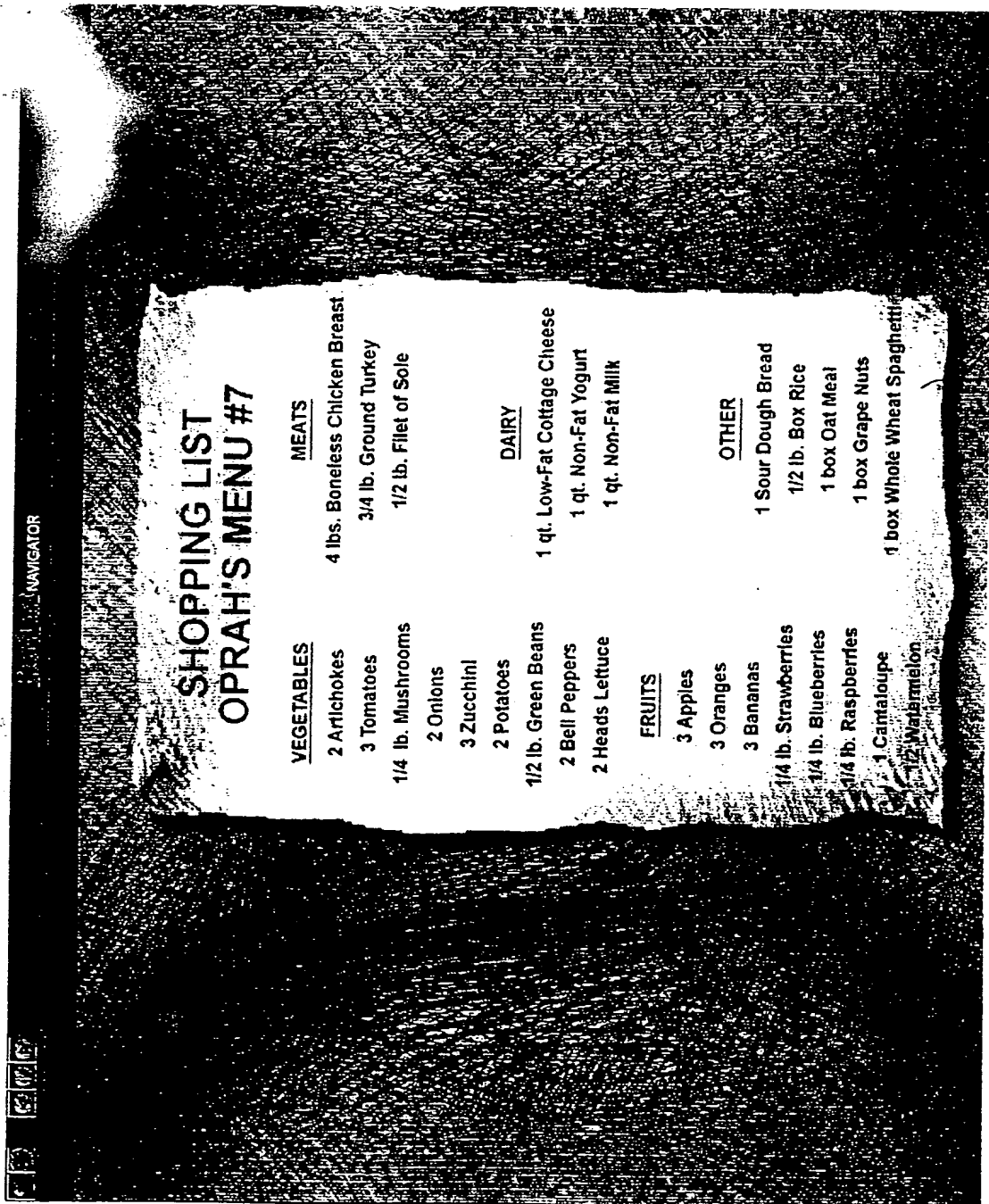
**Nutritional Analysis per Serving**

Calories 160 (Kilocalories 670); Total fat 5g; Saturated fat 1g; Protein 10g; Cholesterol 108mg; Carbohydrates 20g; Sodium 537mg; Dietary fiber 1g; Calories from fat 80%

**Fig. 23**

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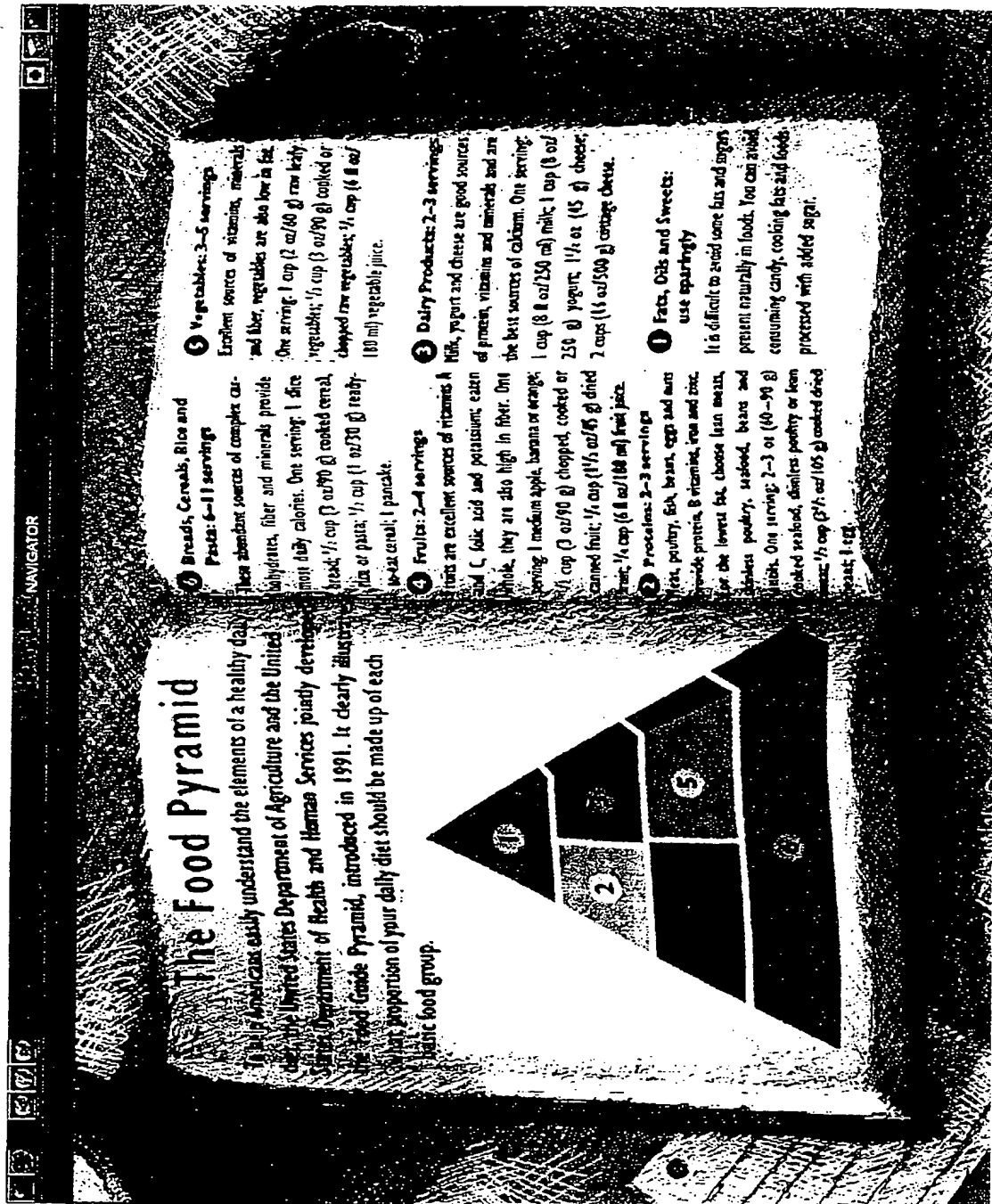
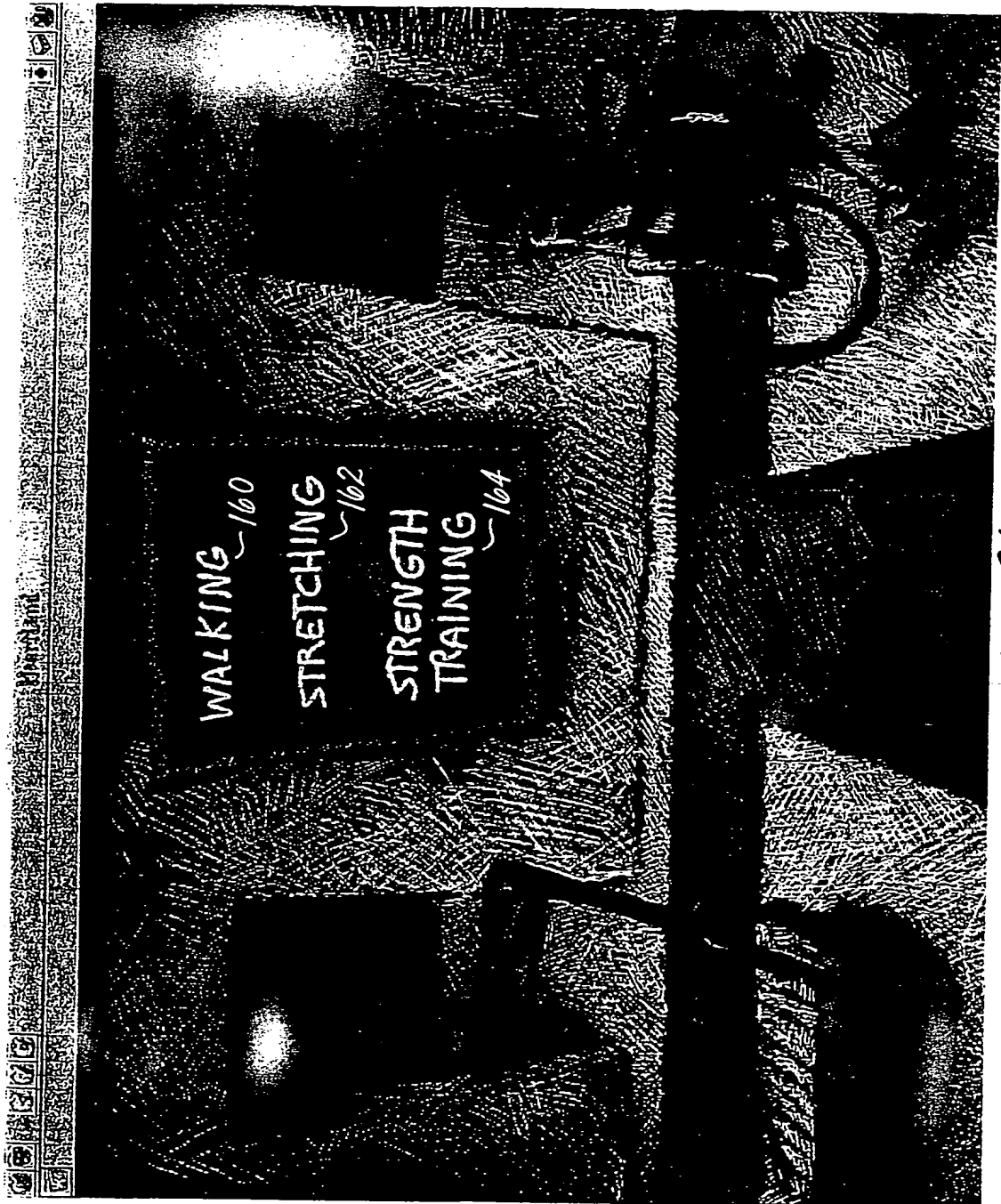
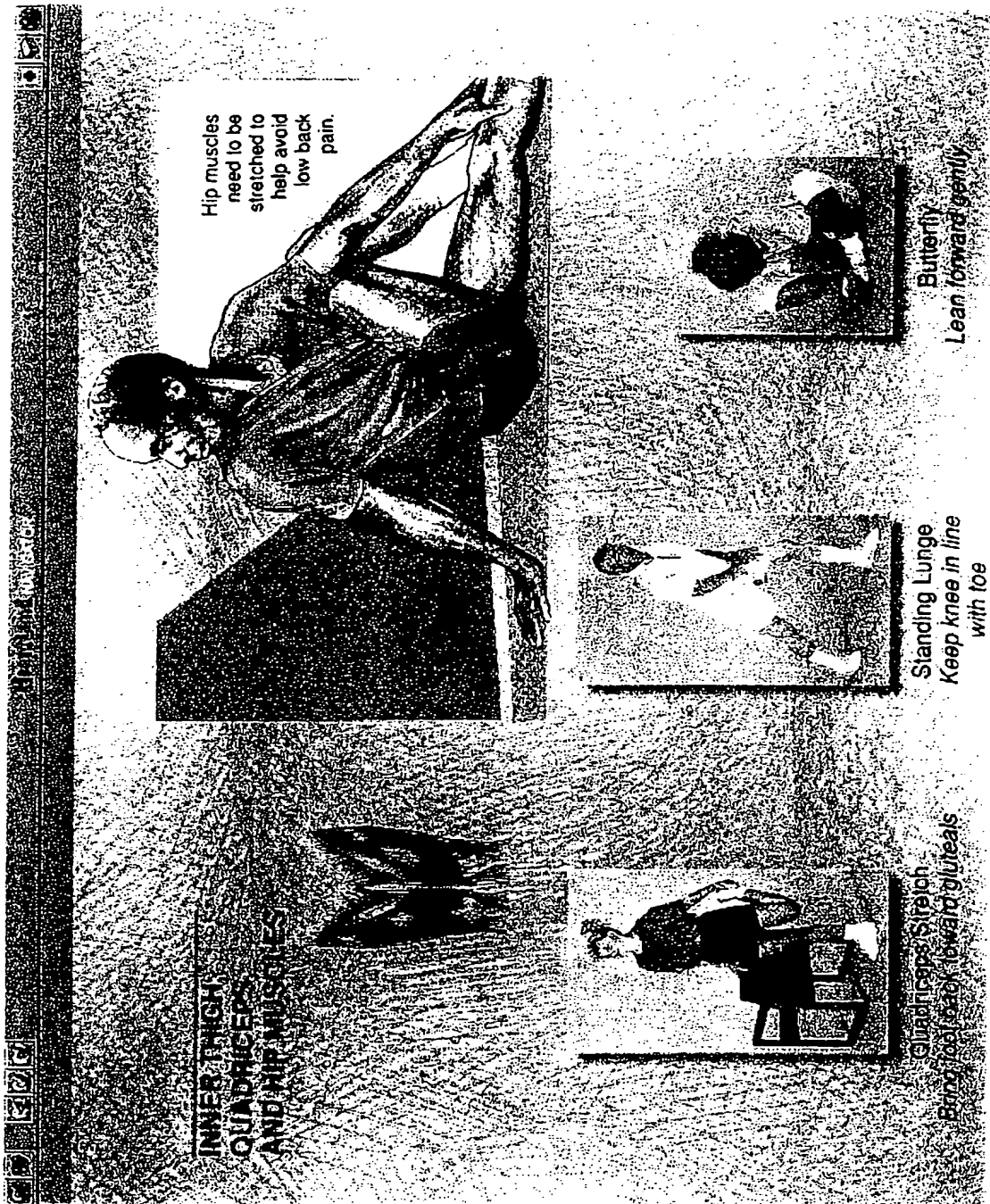


Fig. 25



*Fig. 26*





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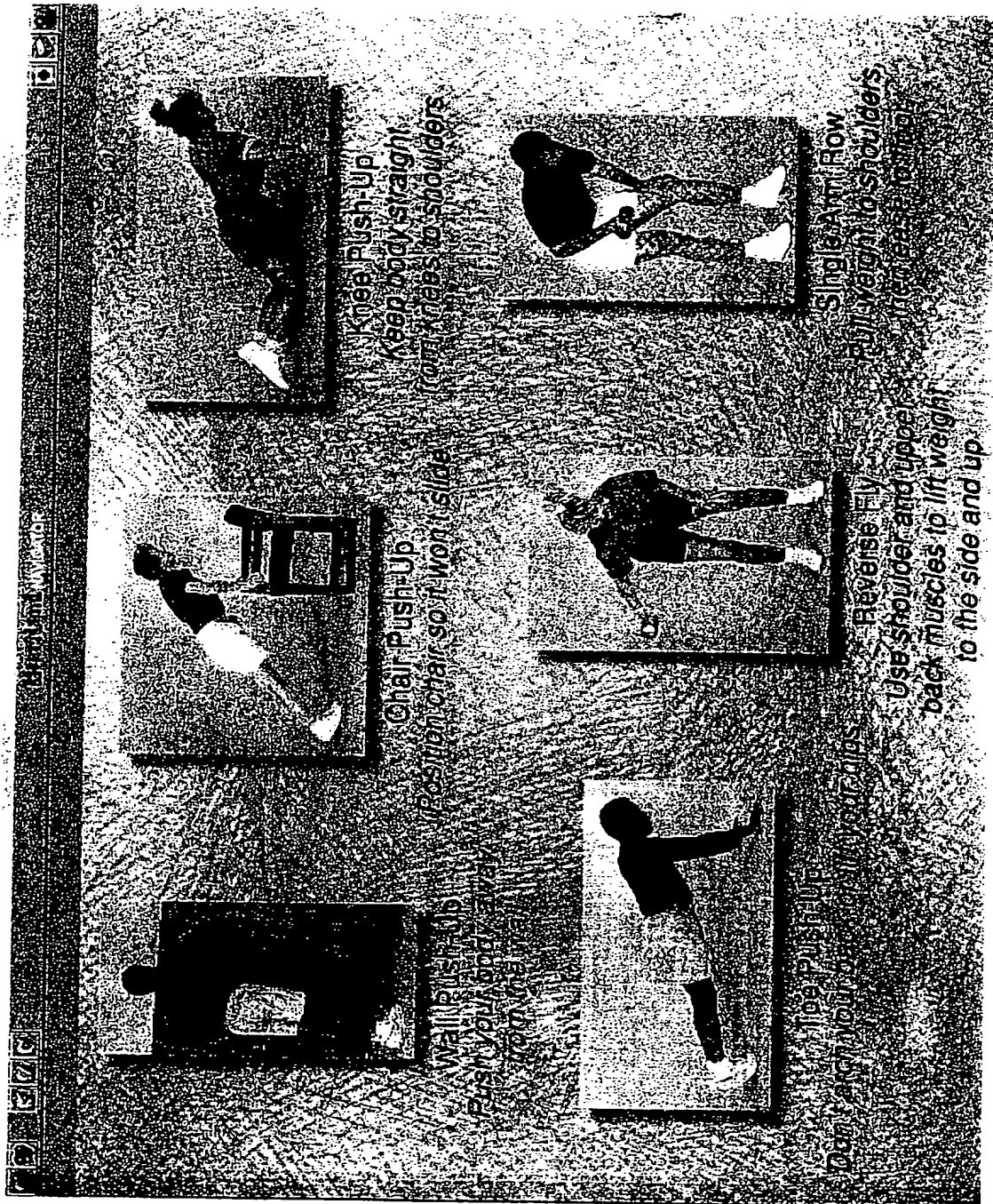


Fig. 28

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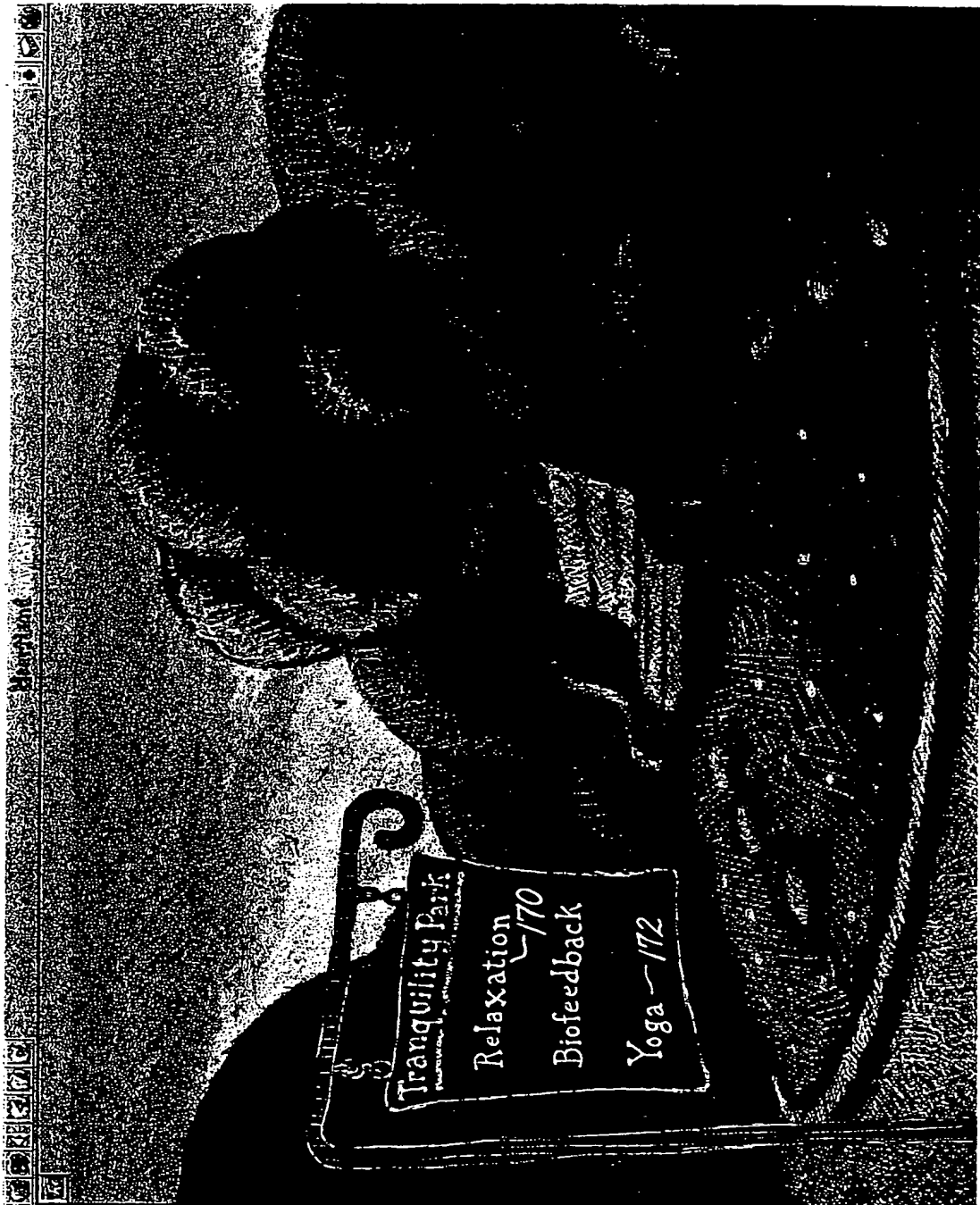


Fig. 29

*Now do anything you would like to do to make the place more homelike and comfortable. You might want to build some type of house or shelter there, perhaps just surround the whole area with a golden light of protection and safety, create and arrange things there for your convenience and enjoyment, or do a ritual to establish it as your special place.*

*From now on this is your own personal inner sanctuary, to which you can return anytime just by closing your eyes and desiring to be there. You will always find it healing and relaxing to be there. It is also a place of special power for you, and you may wish to go there every time you do creative visualization.*

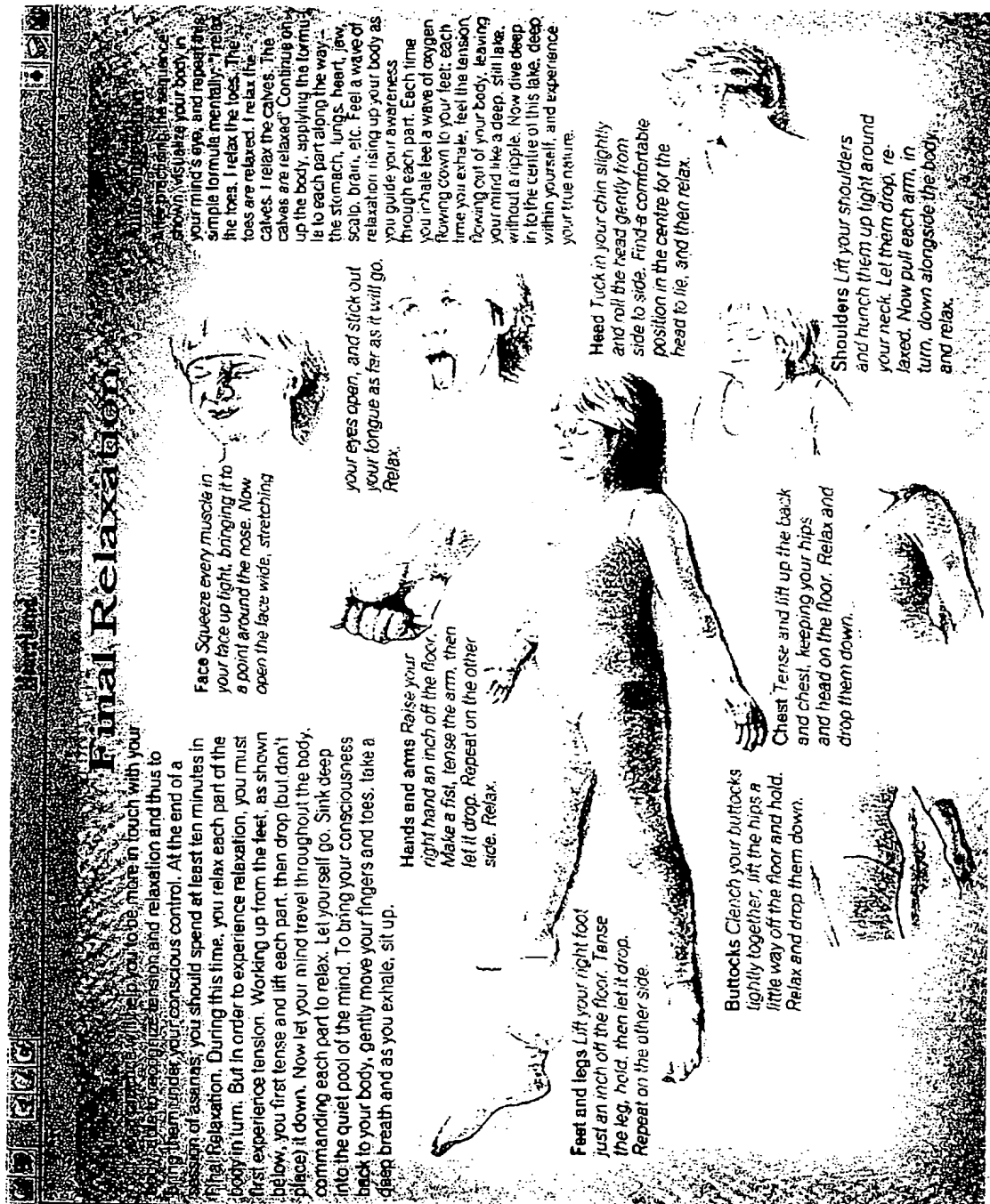
*You may find that your sanctuary spontaneously changes from time to time, or that you want to make changes and additions to it. You can be very creative in your sanctuary and have a lot of fun there ... just remember to retain the primary qualities of peacefulness, tranquility, and a feeling of absolute safety.*

## Creating Your Sanctuary

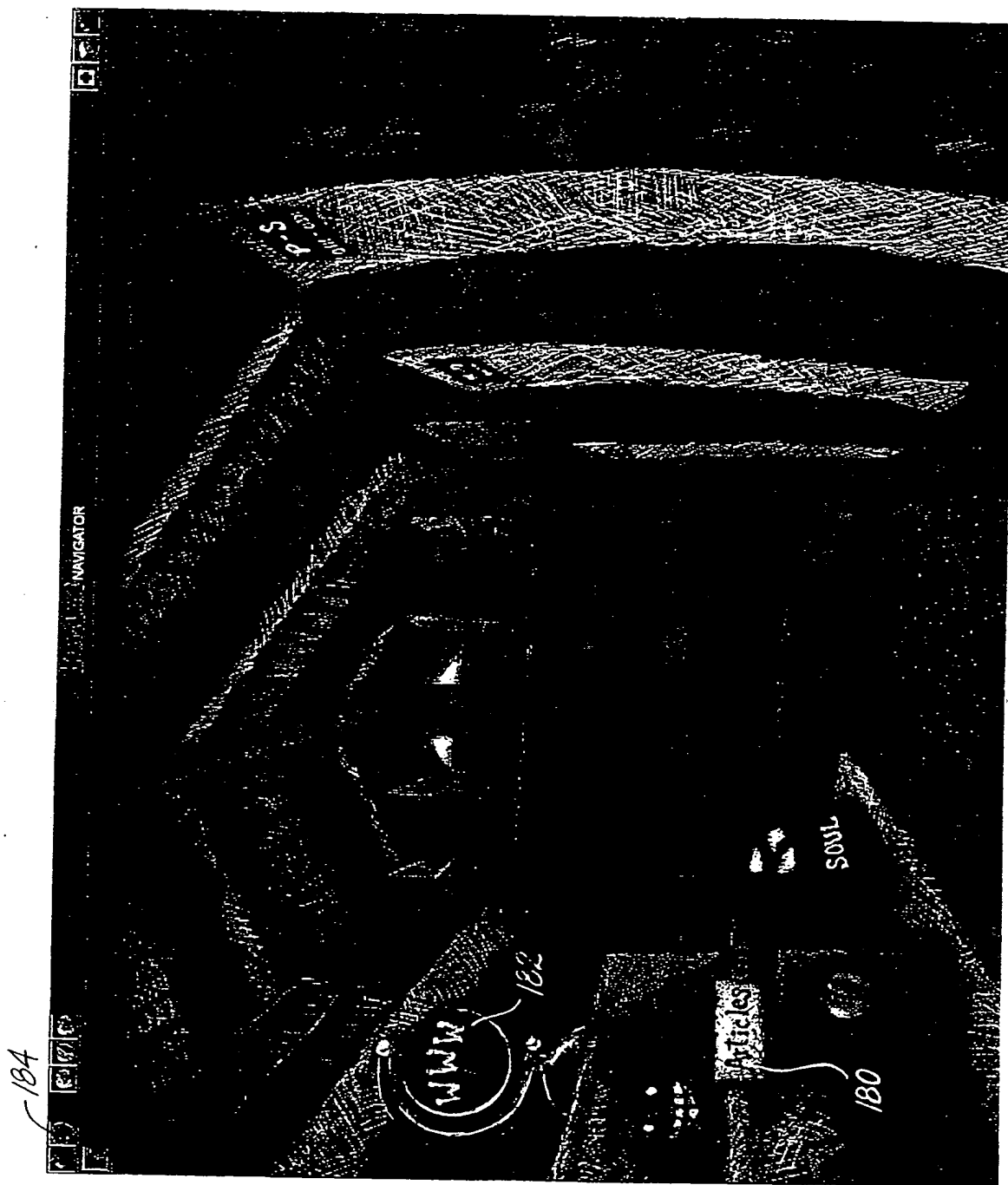
**O**ne of the first things you should do when you start using creative visualization is to create a sanctuary within yourself where you can go anytime you want to. Your sanctuary is your ideal place of relaxation, tranquility, and safety and you can create it exactly as you want it.

*Close your eyes and relax in a comfortable position. Imagine yourself in some beautiful natural environment. It can be anyplace that appeals to you ... in a meadow, on a mountaintop, in the forest, beside the sea. It could even be under the ocean, or on another planet. Wherever it is, it should feel comfortable, pleasant, and peaceful to you. Explore your environment, noticing the visual details, the sounds and smells, any particular feelings or impressions you feel about it.*

*Fig. 30*



*Fig. 31*



*Fig. 32*

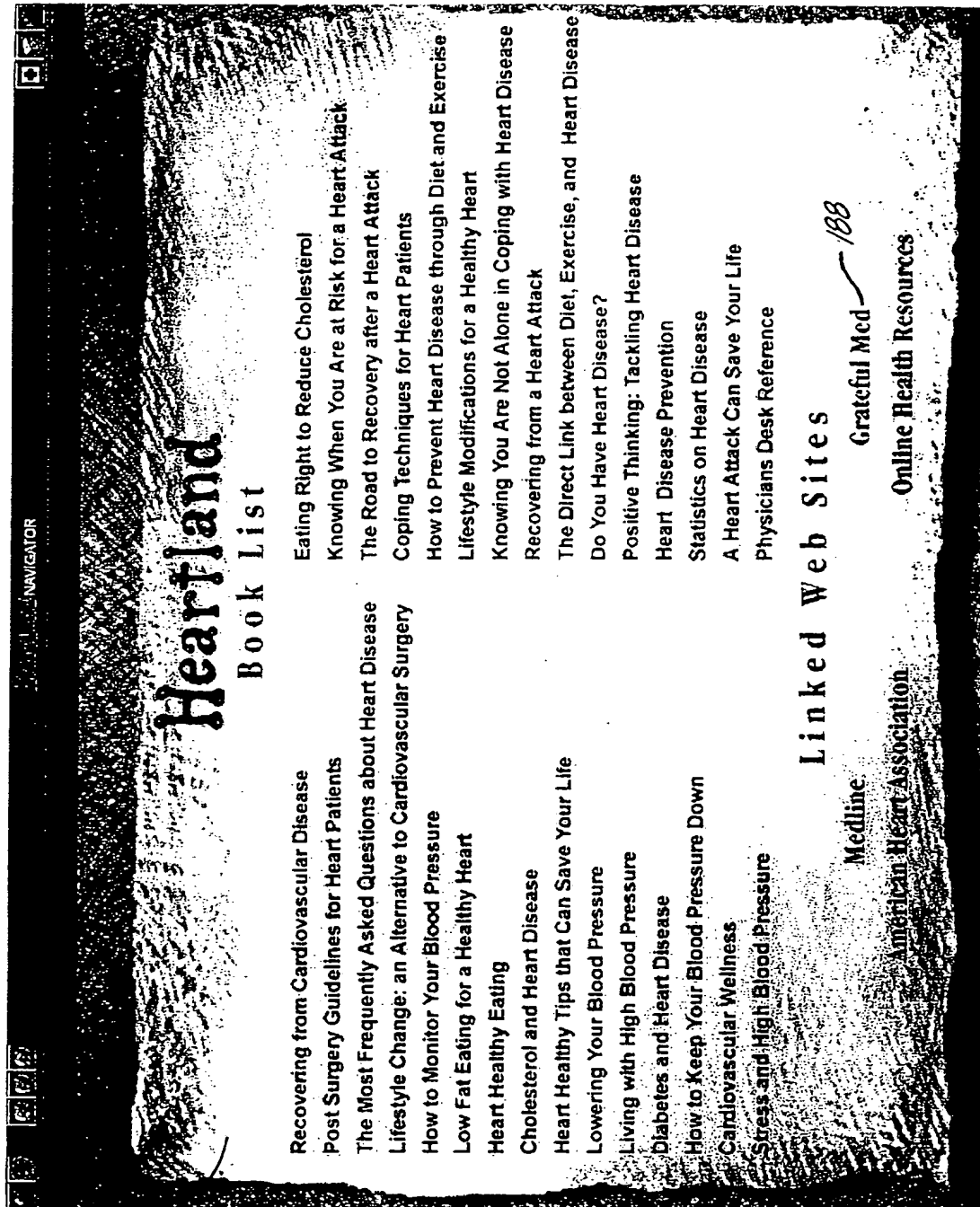


Fig. 33

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Topic

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[Sarojini S. Budden, MD, Oregon Health Sciences University in Portland](#)  
[Also: Neoplasia & Smoking](#), [PTSD & Infertility](#), [Ovarian Case Challenge](#), [Genetic Link](#)

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**Primary**  
[Recognizing and Treating Depression in the Elderly](#)  
[Mark D. Miller, MD, University of Pittsburgh Medical Center](#)

**Newest Articles**

Fig. 34

NAVIGATOR

### DETERMINING YOUR TARGET HEART RATE ZONE

1. Take your pulse on your neck or wrist.
2. Subtract your age from 220.
 

220	- 40 Sample Age
Maximum heart rate 180	
3. Multiply maximum heart rate by .55
 

x .55	99
Lower heart rate limit	
4. Multiply maximum heart rate by .85
 

x .85	153
Upper heart rate limit	
5. Your target heart rate zone is defined by lower and upper heart rate limits.

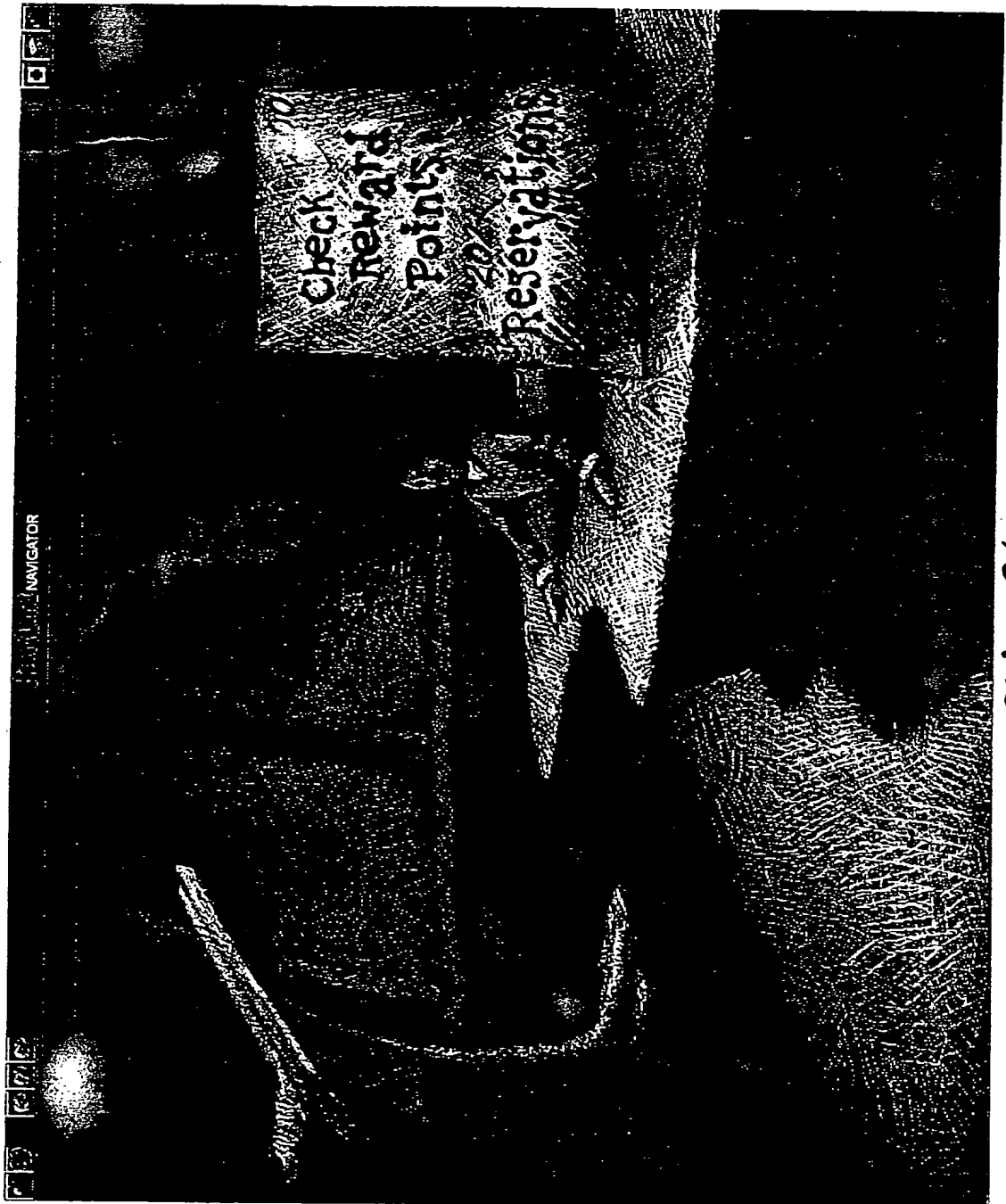
TO SEE IF YOU ARE IN YOUR TARGET HEART RATE ZONE

Take your pulse for :10 seconds and multiply that number by six.

This should be in your Target Heart Rate Zone.

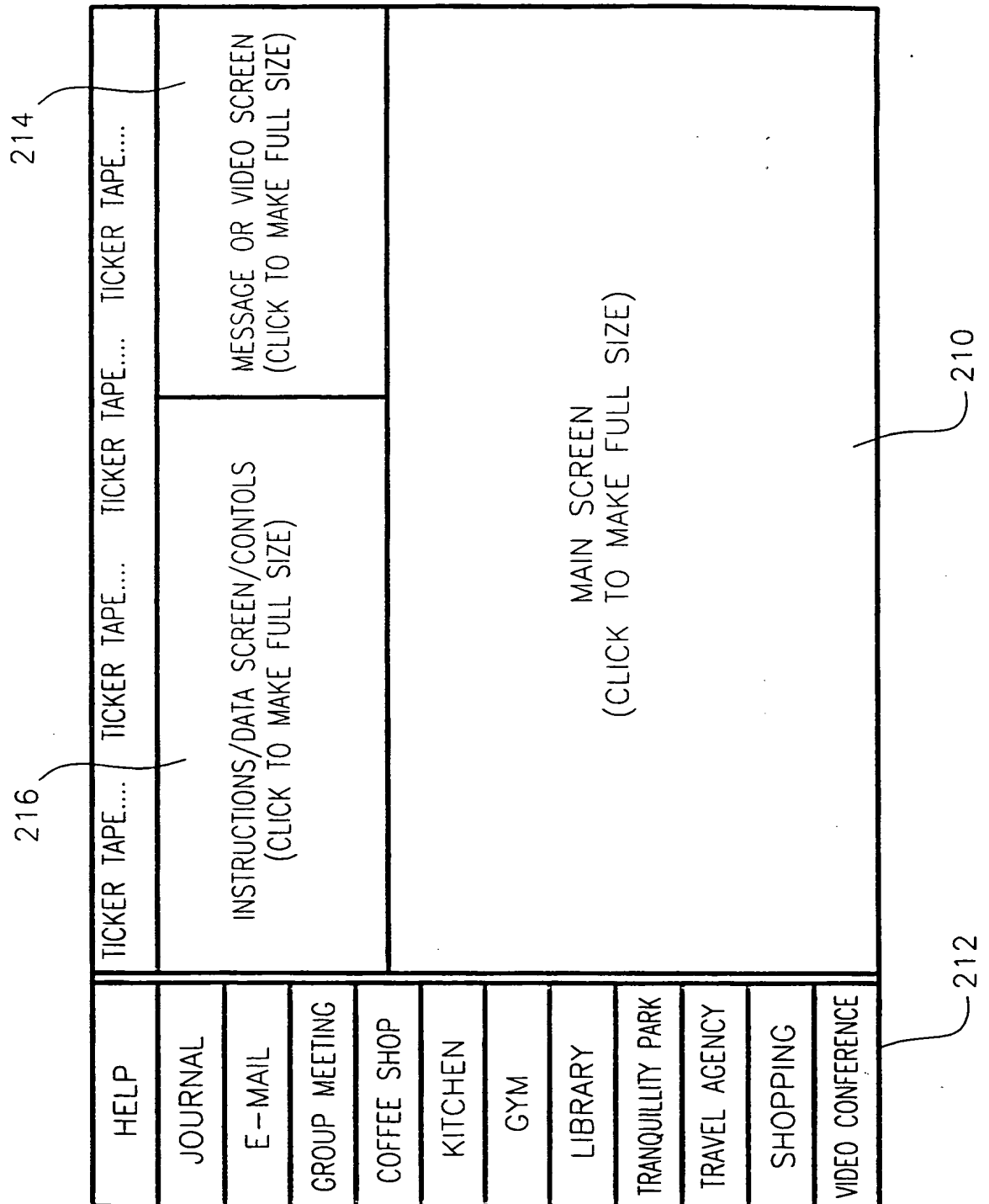
Fig. 35





*Fig. 36*

FIG. 37



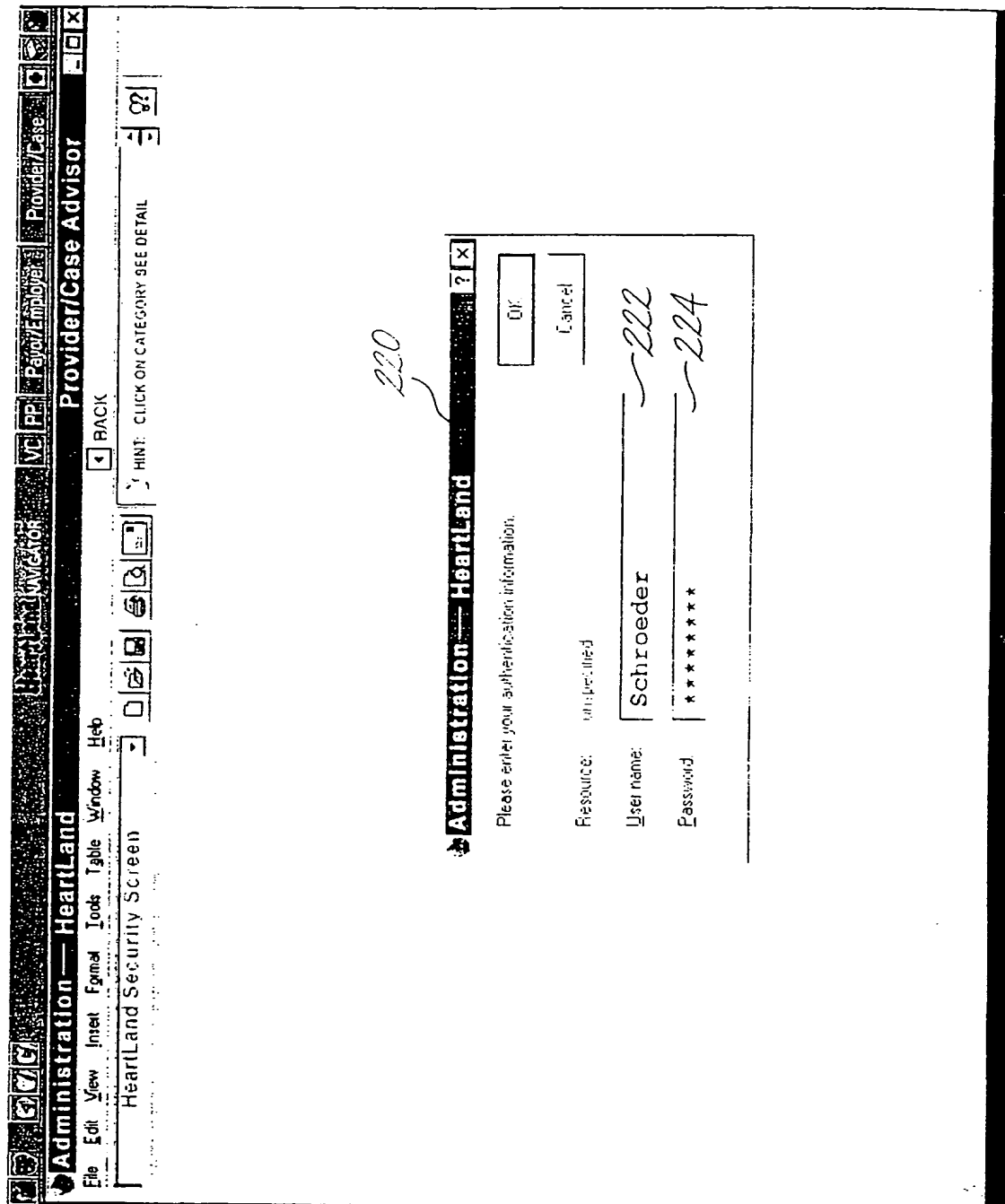


Fig. 38

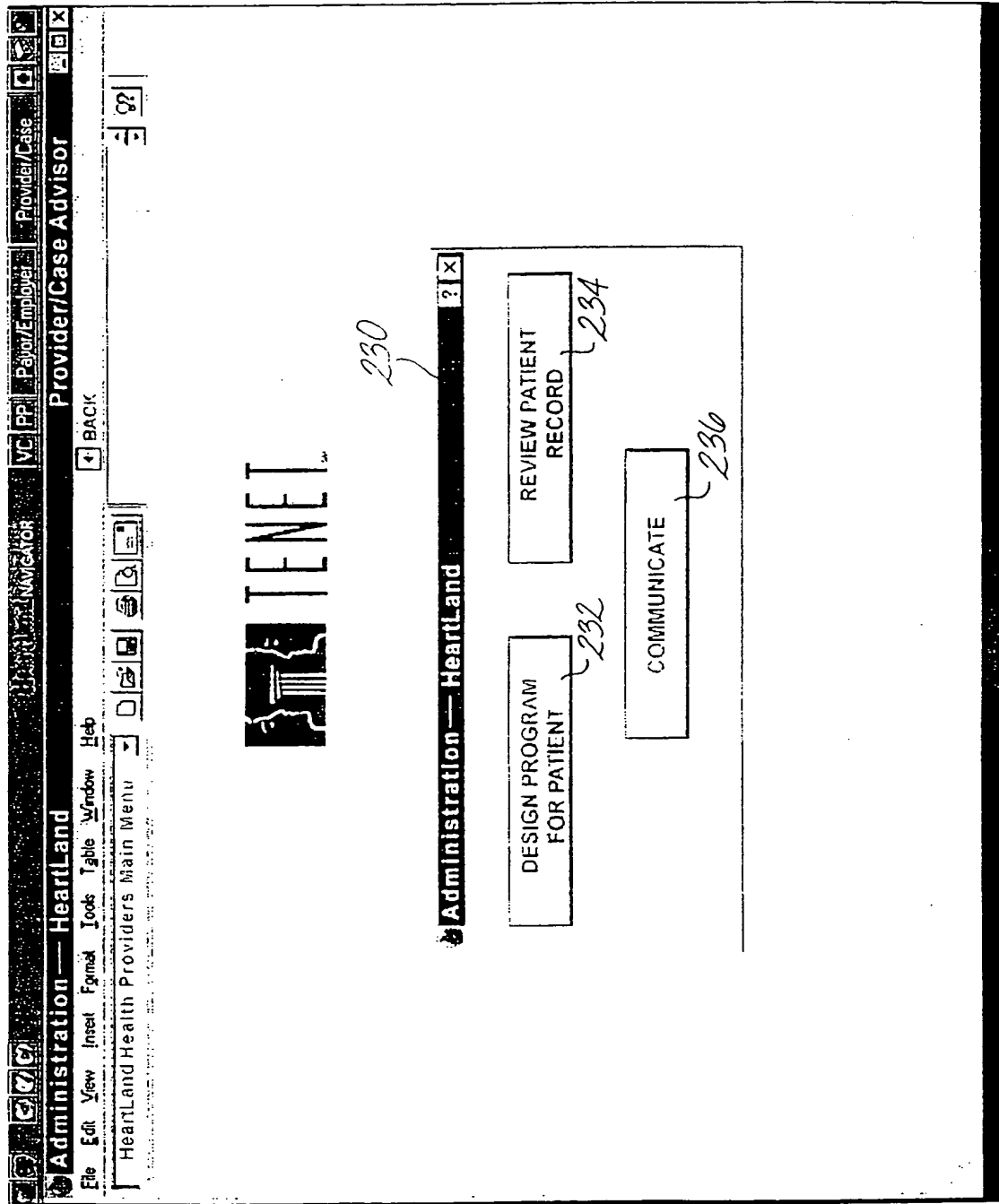


Fig. 39

40/60

**Administration — HeartLand**

File Edit View Insert Format Tools Table Window Help

Heartland Case Management Review

**Provider/Case Advisor**

BACK MAIN MENU

HINT: CLICK ON CATEGORY SET DETAIL

BEHAVIOR RECOMMEND

Provider/Case

Chosen case for review: Fred Smith Date: 3/10/98

Heartland I.D. #: 23-642 Social Security #: 213-48-3947

Subscriber since: 1-1-1998 Total weeks on Heartland program: 1

258 Fred Smith, 48 years, anterior M.I. 1/6/98 Risk Factors: Hypertension, smoker, lack of exercise, elevated LDL cholesterol

TEST/UNIT/DATE	3/10/98	2/17/98	2/24/98	3/2/98	3/9/98
HBP (160/98 mmHG)	156/96	156/92	148/90	148/90	146/92
Cigarettes/day (20)	15	10	0	0	0
Physical Activity minutes/1x-week/RPE	0/0/0	20/3/2	30/4/2	35/4/3.5	35/4/4
Resting H.R. 88	79	68	69	67	67
Weight baseline (180 lbs.)	179 lbs.	178 lbs	176 lbs	175 lbs	172 lbs
Stress level (8) (weekly average)	7.0	7.2	6.9	6.1	6.9
Aspirin 325 mg/day (missed dose/wk)	1	2	1	1	1
Hydrochlorothiazide 12.6 mg daily (missed dose/wk)	1	1	0	0	0
Lovastatin 20 mg/day (missed dose/wk)	1	1	0	0	0
Calories avg / day	3,600		3,300		3,100
Fat Calories %	45%		45%		20%
Cholesterol - LDL	142 mg/dl		140 mg/dl		125 mg/dl
Cholesterol - HDL	35 mg/dl		37 mg/dl		39 mg/dl
Cholesterol	246		225		210

250 B.P. < 140/90 mmHG

252 Complete Smoking Cessation

254 45 mins walking / 7 days week / 6

256 WEIGHT: 170  
BMI: 25.00

3.5 (10=MAX)

Compliant use of Medications

2,800 cal / day

15% fat calories

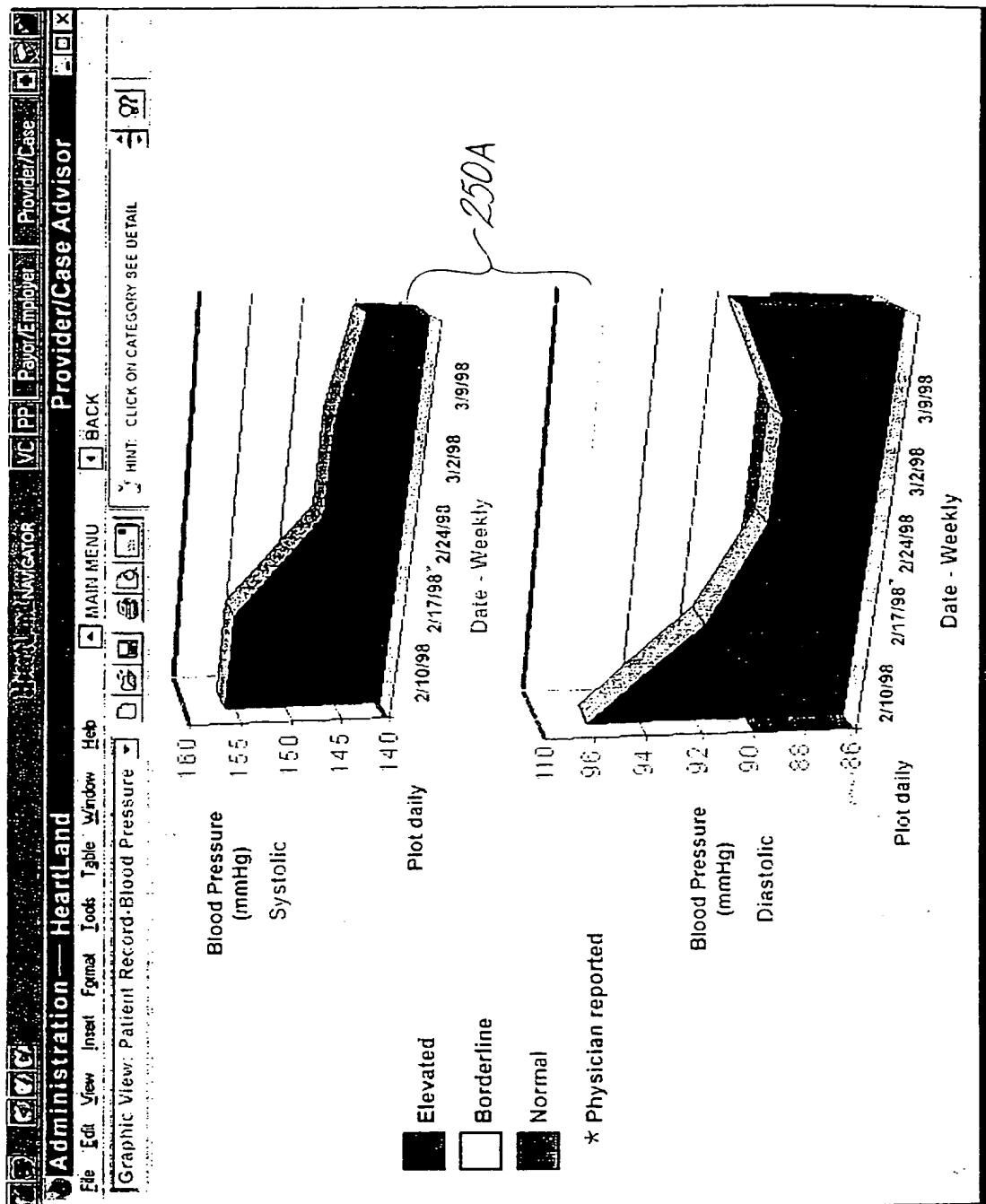
100 mg/dl

45 mg/dl

190

Fig. 40

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*Fig. 41*

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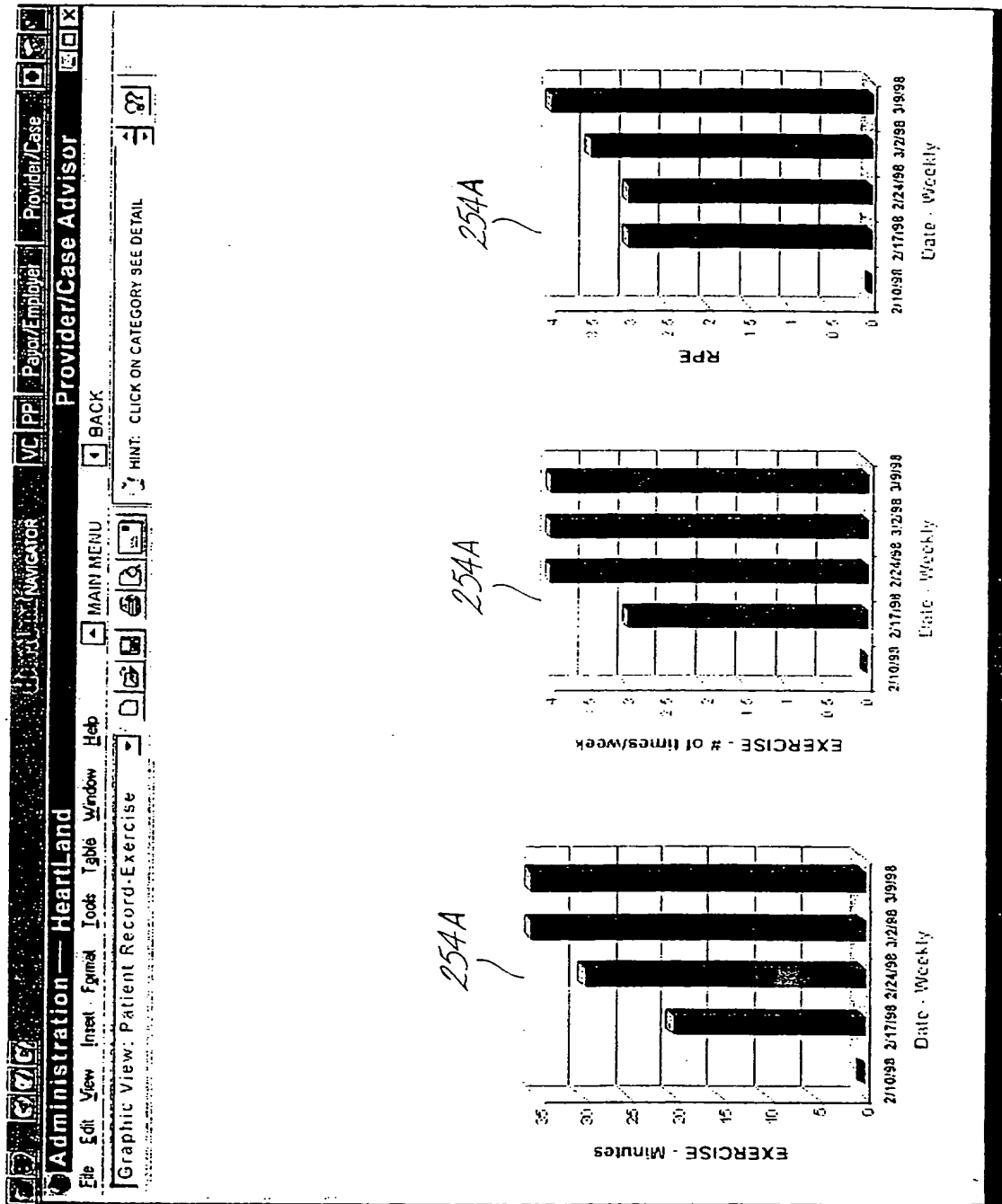
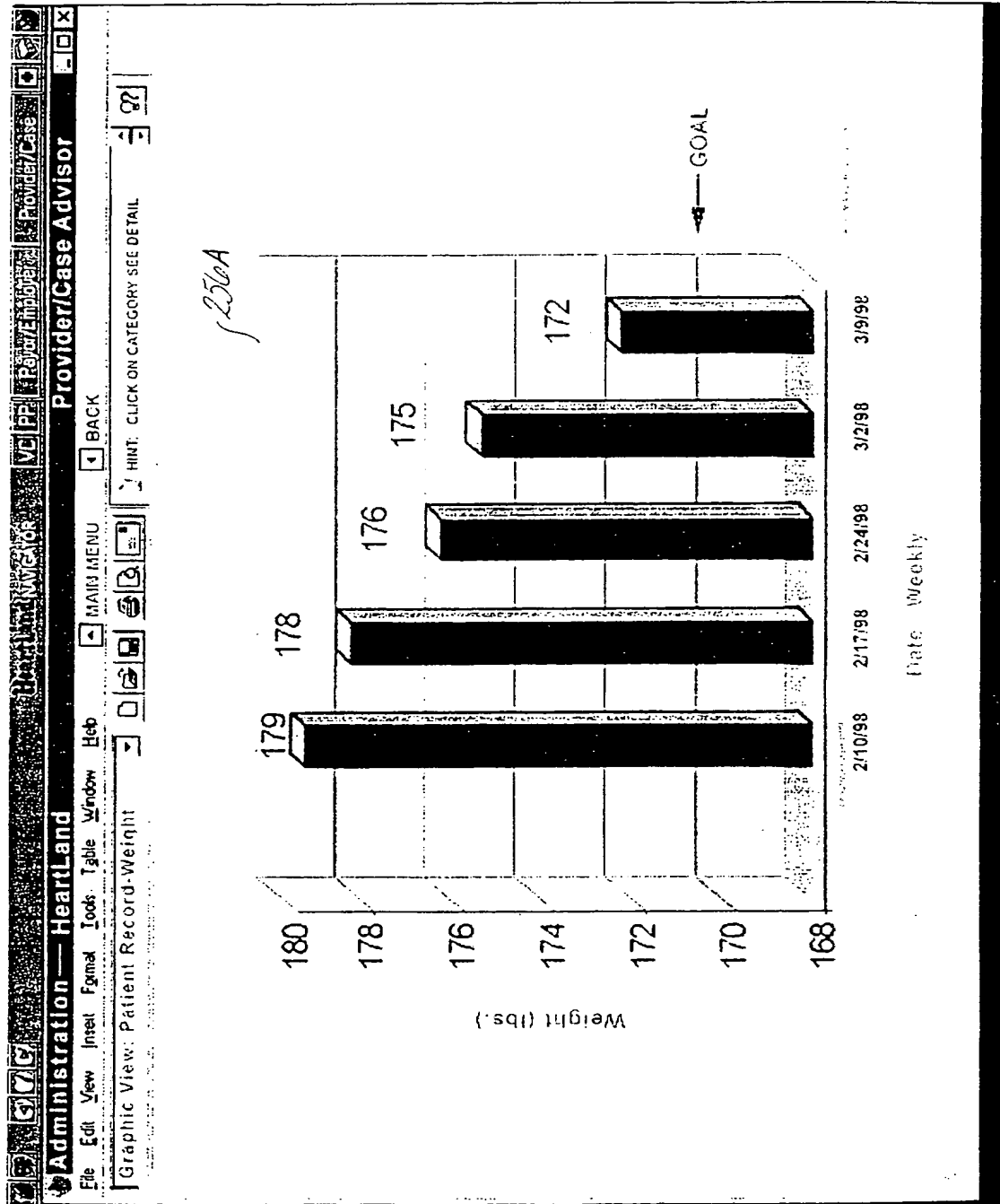


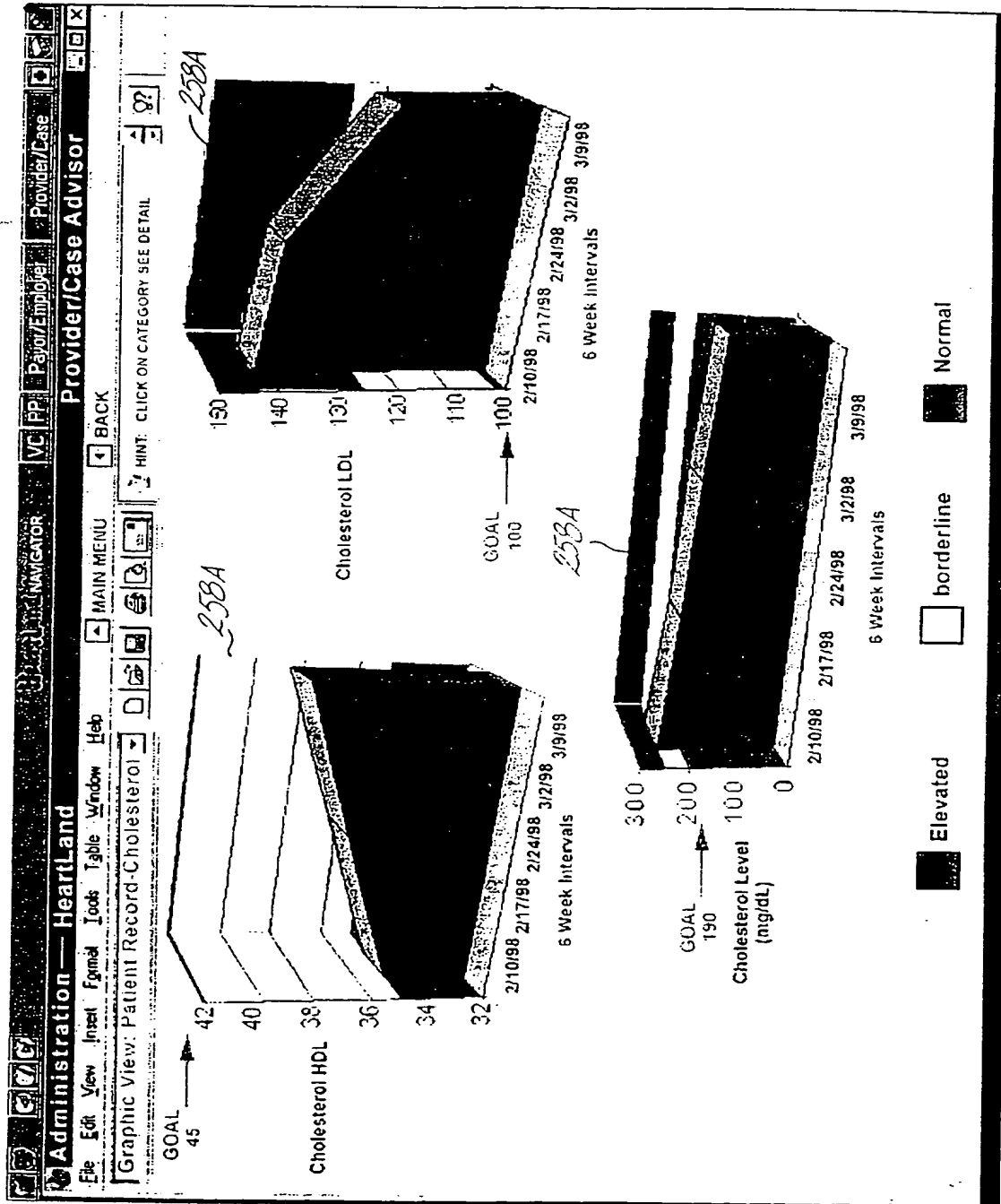
Fig. A2



*Fig. 43*



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**Administration — HeartLand**

File Edit View Insert Format Tools Table Window Help

HeartLand Behavioral Change Assessment

**Provider/Case Advisor**

VC PPI Payor/Employer Provider/Case

BACK

HINT: CLICK ON CATEGORY SEE DETAIL

**BEHAVIORAL CHANGE ASSESSMENT** Fred Smith

Behavioral Intention	2	3	4
Self Efficacy	3	3	4
Social Support	2	3	4
<b>TOTAL</b>	<b>7</b>	<b>9</b>	<b>12</b>

306 308 310

**NOTE: Change Assessment Scored as follows:**

<b>Behavioral Intention</b>	1 No intention to change 2 Considering change 3 Committed to change 4 Strongly committed to change
<b>Self-Efficacy</b>	1 No confidence in ability to change 2 Little confidence in ability to change 3 Confidence in ability to change 4 Certain of ability to change
<b>Social Support</b>	1 Co-workers, friends and family sabotage efforts to change 2 Co-workers, friends and family are apathetic to change 3 Co-workers, friends and family are helpful and co-operative 4 Co-workers, friends and family are willing to change also

*Fig. 45*

<b>Administration — HeartLand</b>		<b>Provider/Case Advisor</b>	
File Edit View Format Tools Table Window Help		VC PP Payer/Employer Provider/Case	
MAIN MENU		BACK	
HINT: CLICK ON CATEGORY SEE DETAIL			

## HeartLand Recommendations

HEARTLAND PATIENT: <u>Fred Smith</u>	PATIENT NUMBER: <u>23-642</u>		
DATE: <u>3/10/98</u>	TOTAL AVERAGE DAILY CALORIES: <u>3,100</u>		
INCREASE EXERCISE TO: <u>45 minutes</u>	TOTAL DAILY CALORIES FROM FAT: <u>465 (15%)</u>		
INCREASE RPE TO: <u>Level 5</u> see the Village Gym for suggestions and preferences	FREQUENCY AND DURATION OF STRESS REDUCTION EXERCISES: <u>45 minutes per sessions at least 5x1 week</u>	ATTEND GROUP SUPPORT SESSIONS: <u>4 times/week</u>	CASE ADVISORY REVIEW: <input type="checkbox"/> 4xmo. <input checked="" type="checkbox"/> 2xmo. <input type="checkbox"/> 1xmo.
INDICATE TO PHYSICIAN BLOOD PRESSURE IN YELLOW ZONE AT: <u>146/92</u>		NEXT PHYSICIAN VISIT DUE: <u>5/25/97</u>	ACCEPTING: <u>330</u> EDITING: <u>332</u> COMMUNICATIONS: <u>334</u>
CHOOSE REWARD FROM: <u>Village Mall</u> For 60 Smoke Free Days		Good support group attendance <u>326</u>	OTHER: <u>324</u> Diet Exercise Stress Support

- Remain cigarette free!  
 - Remember to use your seatbelt!  
 - Remember back and flexibility exercises!

*Fig. 46*

Fig. 47

*Fig. 48*

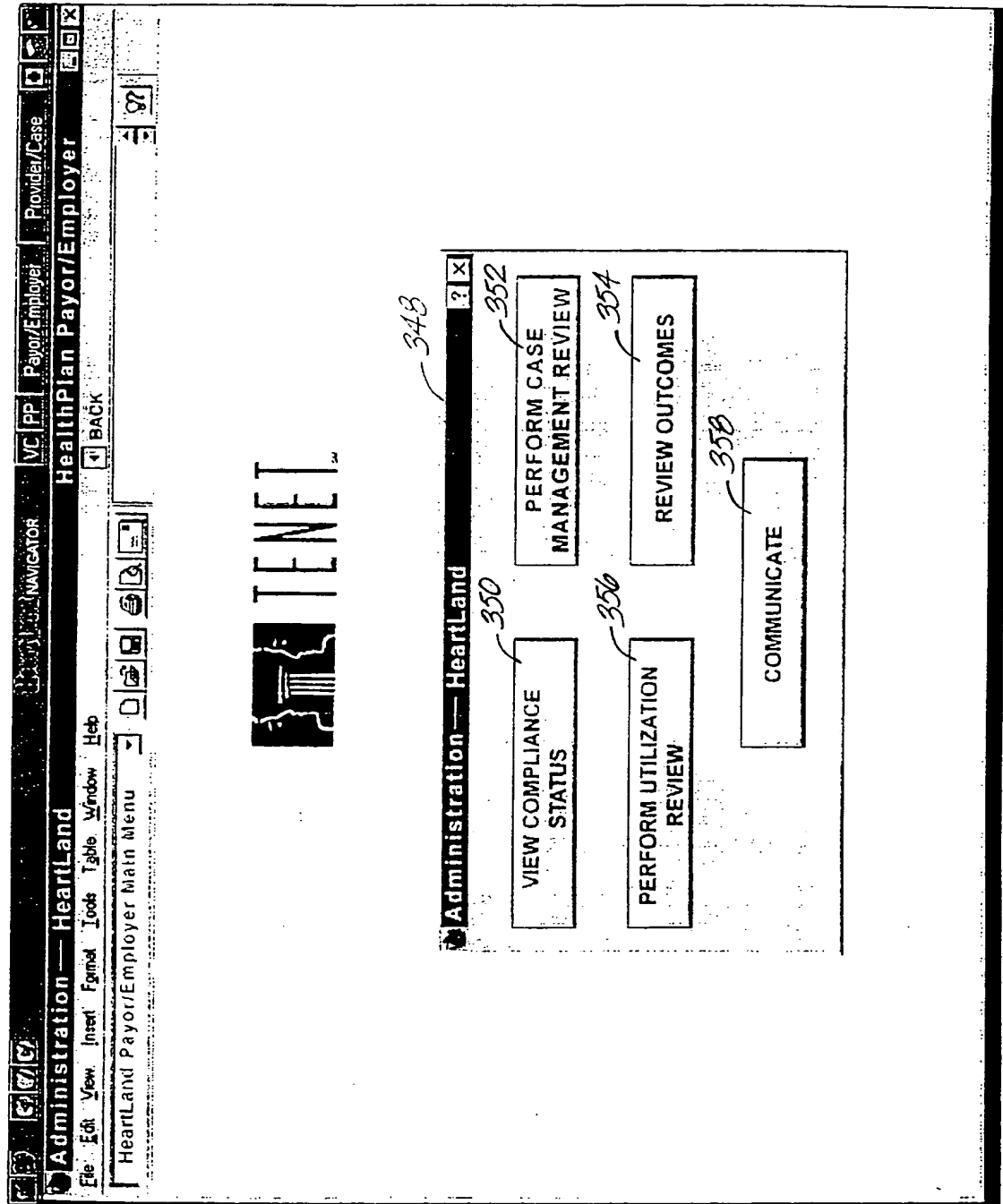


Fig. 49

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Administration—HeartLand

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HeartLand Compliance Status

NAVIGATOR

VC PP Payor/Employer Provider/Case

HealthPlan Payor/Employer

BACK VIEW COMPARATIVE COSTS

HINT: CLICK ON CATEGORY SEE DETAIL

Report Date: July 31, 1998

Time Period: Last 12 months

360 364 366 372 376

Category	Description	Total Eligible	Participating		Compliant		Probation		Terminated	
			No. eligible	Pct. eligible	No.	Pct.	No.	Pct.	No.	Pct.
Category I	Current-Year MI Survivors	1,009	105	10.4%	87	82.9%	13	12.4%	5	4.8%
Category II	Current-Year Bypass & Angioplasty	733	76	10.4%	59	77.6%	10	13.2%	7	9.2%
Category III	Current-Year Diagnosed CAD, Surgery Rec	740	71	9.6%	63	88.7%	5	7.0%	3	4.2%
Category IV	All Diagnosed Angina	6,726	708	10.5%	553	78.1%	84	11.9%	71	10.0%
Category V	Prior-Years' MI & Post-Surgical - High Risk	2,183	680	31.1%	585	86.0%	38	5.6%	57	8.4%
Category VI	Prior-Years' MI & Post-Surgical - Low Risk	6,547	227	3.5%	187	82.4%	22	9.7%	18	7.9%
Category VII	(2 or more factors)	75,826	3,191	4.2%	2,765	86.6%	148	4.6%	278	8.7%
	Wellness Program	126,714	7,920	6.3%	6,267	79.1%	1,359	17.2%	294	3.7%
Grand Totals & Percent Averages			12,978		10,566	81.4%	1,679	12.9%	733	5.6%

Fig. 50

Administration—Heartland HealthPlan Payor/Employer

File Edit View Format Tools Window Help

Heartland Comparative Cost Review

VC PP Payor/Employer Provider/Case

MAIN MENU BACK

HINT: CLICK ON CATEGORY SEE DETAIL

Report Date: July 31, 1998

Time Period: Last 12 months

Category	Description	Number on Program	Heartland Group Medical Costs	Heartland Program Costs	TOTAL HEARTLAND COSTS	Control Group Medical Costs	Heartland Savings
Category I	Current-Year MI Survivors	105	253,385	181,850	435,015	589,221	154,208
Category II	Current-Year Bypass & Angioplasty	76	140,678	122,360	263,036	327,153	64,117
Category III	Current-Year Diagnosed CAD, Surgery Rec	77	240,702	133,210	373,912	559,772	185,860
Category IV	All Diagnosed Angina	708	1,139,172	1,047,840	2,187,012	2,648,237	462,225
Category V	Prior-Years' MI & Post-Surgical - High Risk	680	1,640,840	1,006,400	2,647,240	3,815,907	1,188,667
Category VI	Prior-Years' MI & Post-Surgical - Low Risk	227	420,177	197,490	617,667	977,158	359,489
Category VII	(2 or more factors)	3,191	2,003,948	717,975	2,721,923	4,680,344	1,938,421
Category VIII	Wellness Program	7,920	2,304,720	-	2,304,720	5,359,814	3,055,094
TOTALS		12,984	8,143,600	3,406,925	11,550,525	18,938,605	7,388,080

380 382 384

Fig. 51



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Administration — Heartland

VC PP Payor/Employer Provider/Case  
HealthPlan Payor/Employer

NAVIGATOR MAIN MENU BACK

File Edit View Insert Format Tools Table Window Help

HeartLand Case Review

HINT: CLICK ON CATEGORY SEE DETAIL

The patient you have chosen for review

☒ HAS ☐ HAS NOT

signed a limited waiver of confidentiality.  
The following information reflects this choice

CONTINUE

392

Fig. 52

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400

Administration — HeartLand

VC PP Payor/Employer Provider/Case

HealthPlan Payor/Employer

VC BACK REVIEW COSTS REVIEW MEDICAL ACTIVITY

HeartLand Case Management Review

HINT: CLICK ON CATEGORY SEE DETAIL

Chosen case for review: Fred Smith Date: 3/10/98

Heartland I.D. #: 23-642 Social Security #: 213-48-3947

Subscriber since: 1/20/90 Total weeks on Heartland program: 4

Fred Smith: 48 years, anterior M.I. 1/6/98 Risk Factors: Hypertension, smoker, lack of exercise, elevated LDL cholesterol

BASELINE (1/20/98)	2/10/98	2/17/98	2/24/98	3/2/98	3/9/98	GOALS
HBP (160/98 mmHG)	166/96	168/92	148/90	148/90	146/92	B.P. < 140/90 mmHG
Cigarettes/day (20)	16	10	0	0	0	Complete Smoking Cessation
Physical Activity minutes/x-week/IRPE	0/0/0	20/3/3	30/4/3	35/4/3.5	35/4/4	45 mins walking / 7 days week / 6
Resting H.R. 88	79	68	69	67	67	
Weight baseline (180 lbs.)	179 lbs.	178 lbs.	176 lbs.	175 lbs.	172 lbs.	WEIGHT: 170 BMI: 25.00
Stress level (8)	7.0	7.2	6.9	6.1	6.9	3.5 (10=MAX)
Aspirin 325 mg/day (missed dose/wk)	1	2	1	1	1	Compliant use of Medications
Hydrochlorothiazide 12.5 mg. daily (missed dose/wk)	1	1	0	0	0	
Lovastatin 20 mg/day (missed dose/wk)	1	1	0	0	0	
Calories avg / day	3,800		3,300		3,100	2,800 cal / day
Fat Calories %	45%		45%		28%	15% fat calories
Cholesterol - LDL	142 mg/dl		140 mg/dl		125 mg/dl	100 mg/dl
Cholesterol - HDL	36 mg/dl		37 mg/dl		39 mg/dl	45 mg/dl
Cholesterol	246		225		210	190

Fig. 53

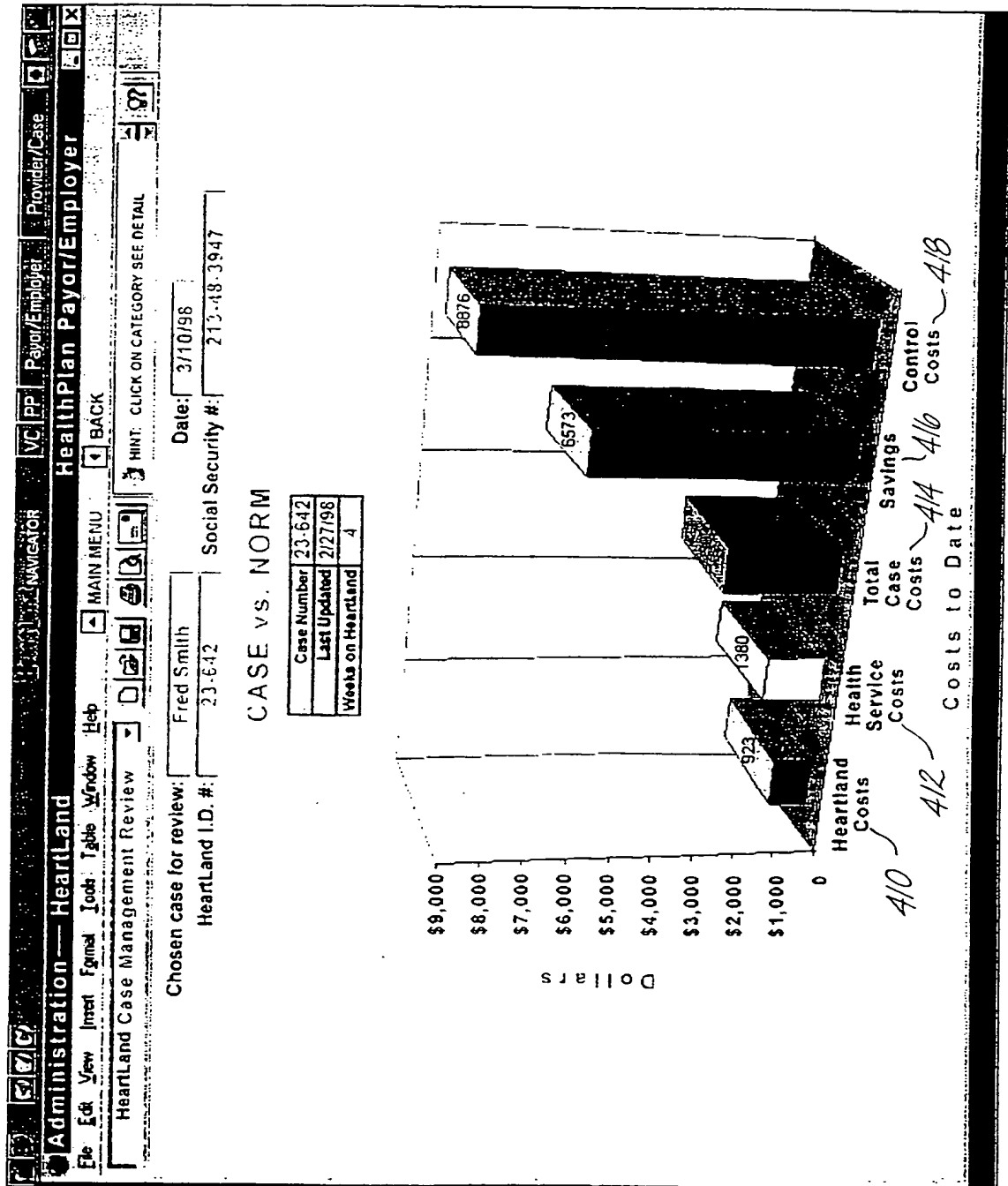


Fig. 5A

*Fig. 55*

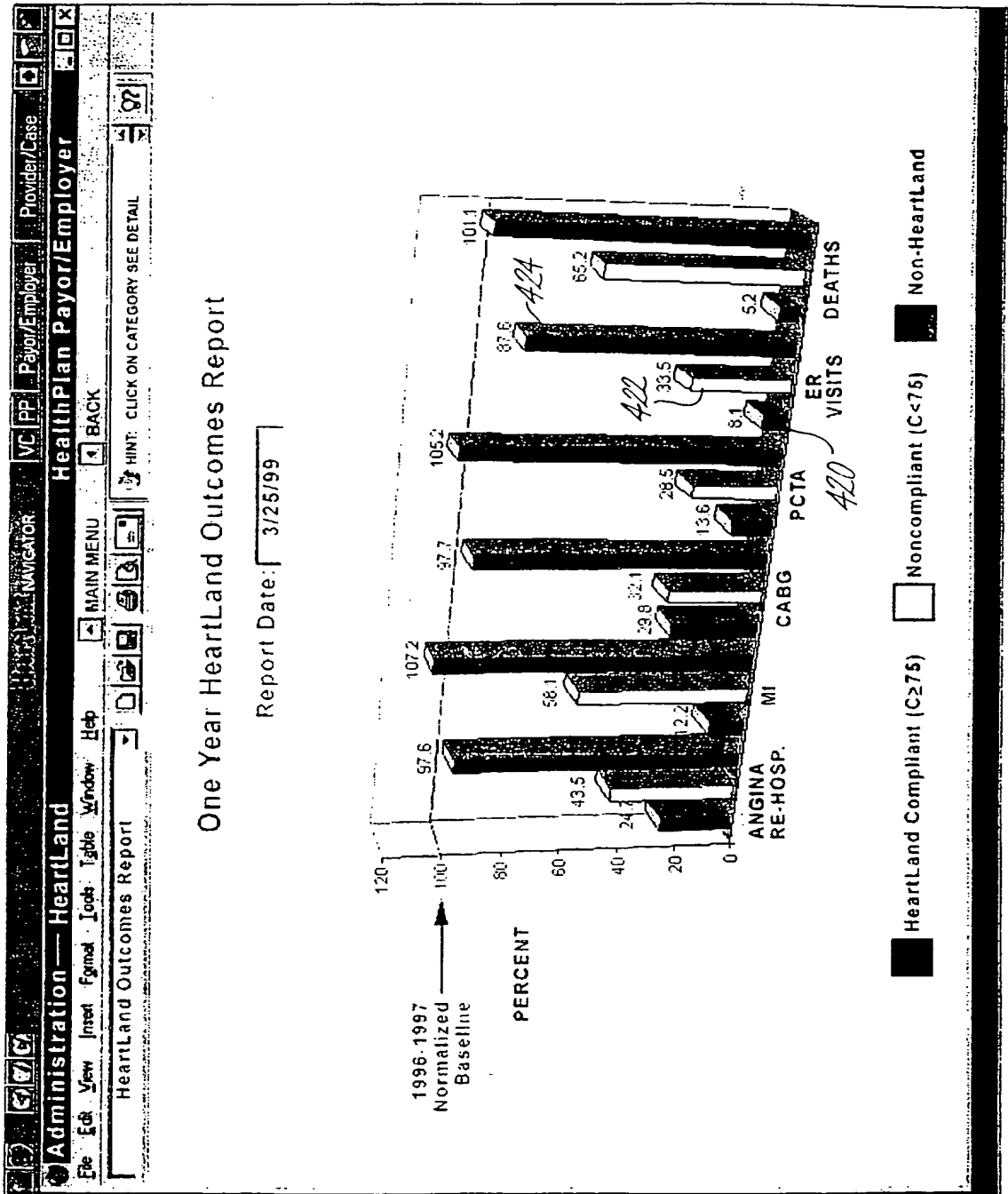


Fig. 56

Administration — HeartLand

File Edit View Insert Format Tools Table Window Help

HeartLand Utilization Review

MAIN MENU

BACK REVIEW MORE GROUPS/FACILITIES

HINT: CLICK ON CATEGORY SEE DETAIL

## Utilization Review

Target: 23%

Group or Facility	ID No.	Specialty	YTD CAD Cases	Percent referred to Heartland	Percent Heartland vs. norm
Central Valley IPA	8224	Primary	28	22.90%	-0.10%
Baywatch Phys & Sur	9732	Cardio	127	16.70%	-6.30%
Fulton Cty. Cardiolog.	5376	Cardio	89	24.50%	1.50%
Care Fndn of Clovis	8479	Primary	52	23.50%	0.50%
Riverside Primary Care	6745	Primary	77	18.80%	-4.20%

430

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*Fig. 57*

Administration — HeartLand  
 File Edit View Insert Format Tools Table Window Help  
 HeartLand Utilization Review  
 NAVIGATOR VC PP Payor/Employer Provider/Case  
 HealthPlan Payor/Employer  
 MAIN MENU BACK REVIEW MORE PHYSICIANS  
 HINT: CLICK ON CATEGORY SEE DETAIL

## Perform Healthplan Utilization Review

Physician	ID No.	Specialty	YTD CAD Cases	YTD norm is 17.3%	Percent Heartland vs. norm
Moeller, J	66637	Cardio	30	15.6%	-2.2%
King, S	29873	Cardio	38	32.6%	+1.4%
Carvell, C	89721	Primary	18	12.0%	-4.3%
Richards, B	52883	Primary	42	18.7%	+1.4%

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Administration — HeartLand  
File Edit View Insert Format Tools Table Window Help

HeartLand Case Advisory System

NAVIGATOR VC PP Payor/Employer Provider/Case  
HealthPlan Payor/Employer

MAIN MENU BACK

HINT: CLICK ON CATEGORY SEE DETAIL

## HeartLand Communications Center

Send Messages to...

*450* ☒ Heartland ☐ Subscriber *454*  
☒ Responsible Physician *452*  
☐ Other

Select Type of Message

☐ Audio E-Mail *456*  
☐ Text E-Mail *458*  
☐ FAX *460*

Type Text Message here:

Record Message here:

SEND MESSAGE

Fig. 58

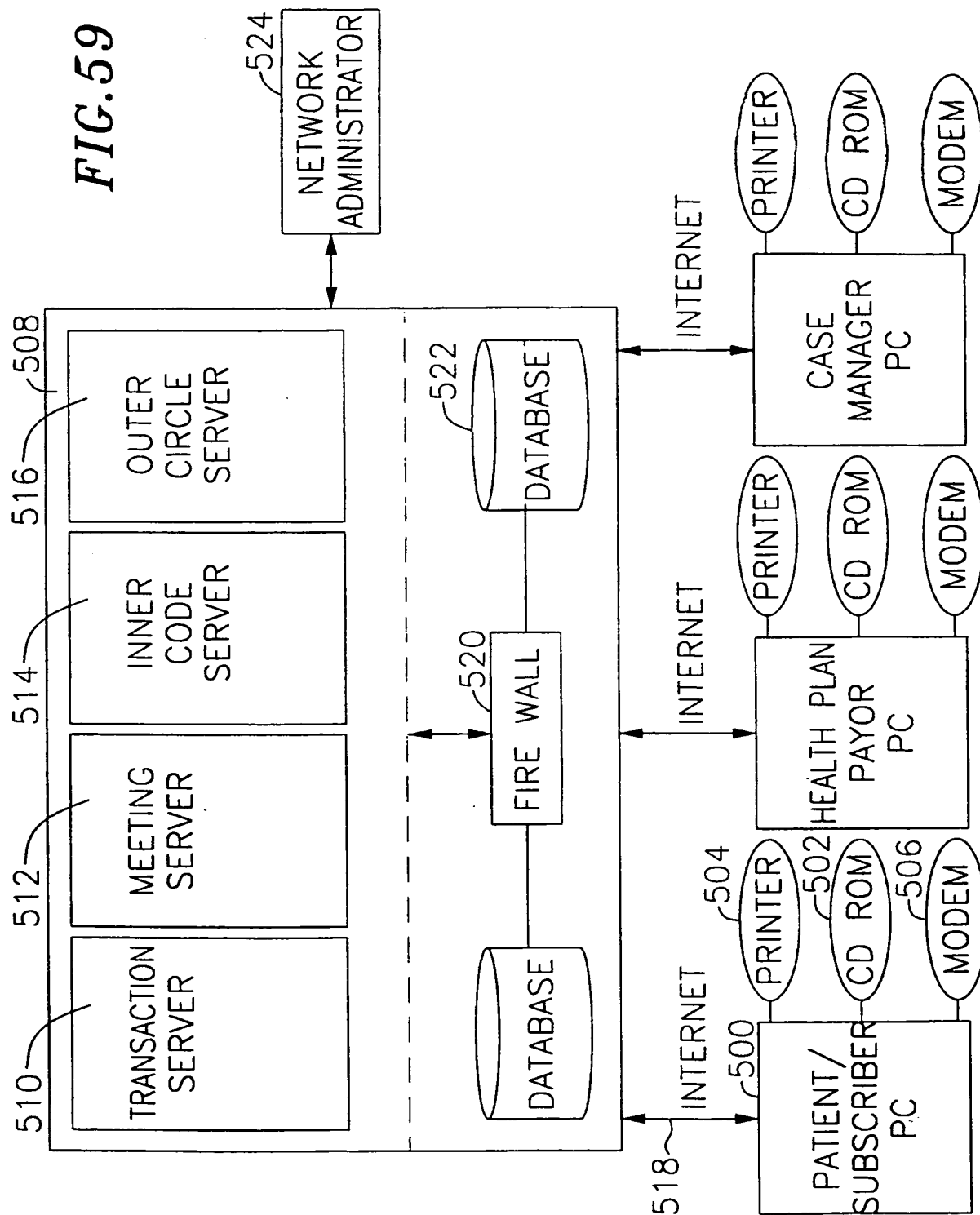
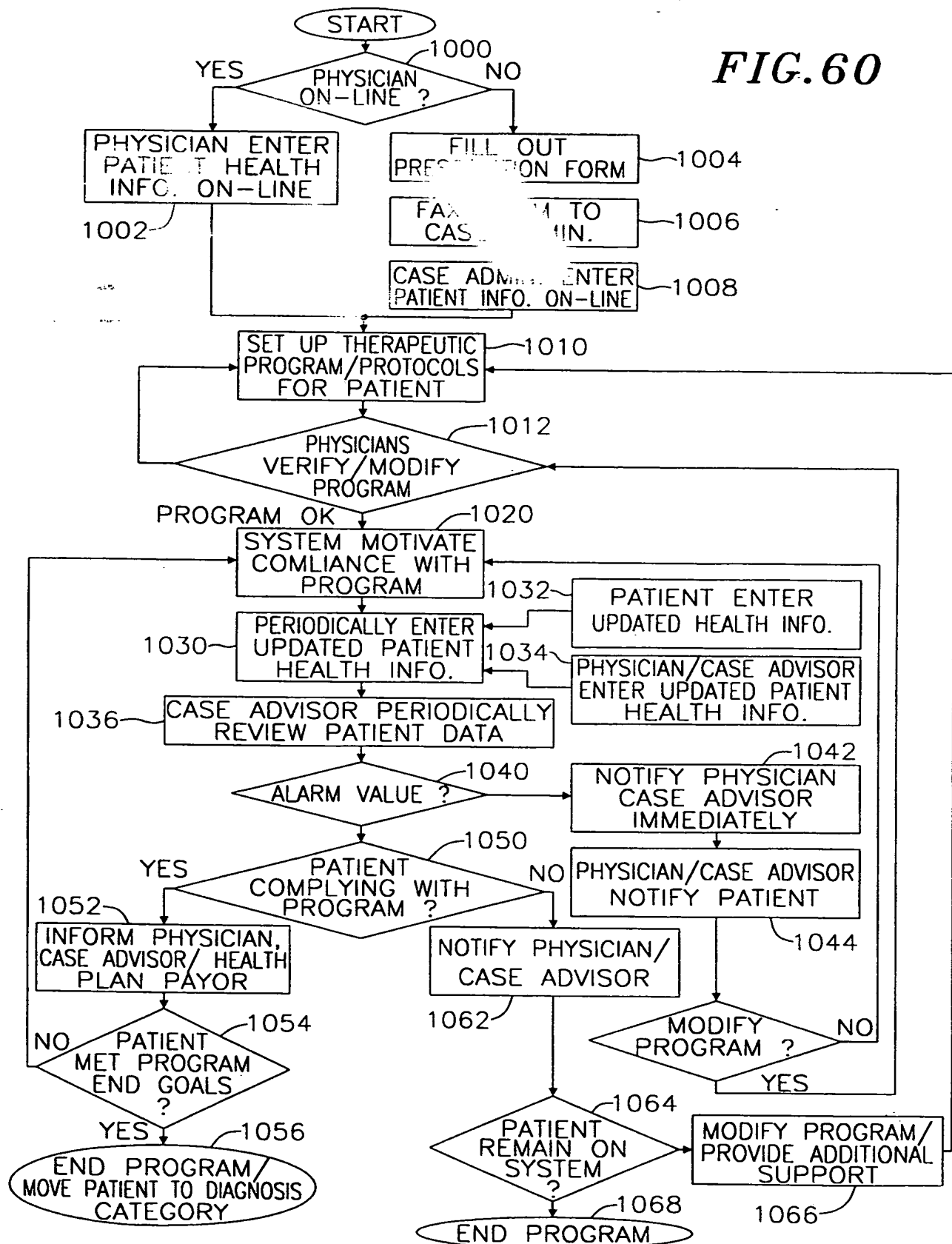




FIG. 60



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US98/14147

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G06F 15/00

US CL : 128/920; 600/300

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 128/897, 898, 920, 921, 923; 600/300, 301; 704/251, 501, 504; 705/2-4

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 5,673,691 A (ABRAMS et al) 07 October 1997, col. 3 line 34 to col. 6 line 56.	1, 3
A	US 5,612,869 A (LETZT et al) 18 March 1997, entire document.	1-35
A	US 5,301,105 A (CUMMINGS, JR.) 05 April 1994, entire document.	1-35
A	US 5,377,258 A (BRO) 27 December 1994, entire document.	1-35

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

Special categories of cited documents:		*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A	document defining the general state of the art which is not considered to be of particular relevance		
*E	earlier document published on or after the international filing date	*X	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*L	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Y	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*O	document referring to an oral disclosure, use, exhibition or other means		
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Date of the actual completion of the international search 11 SEPTEMBER 1998	Date of mailing of the international search report 15 OCT 1998
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ERIC F. WINAKUR Telephone No. (703) 308-3940